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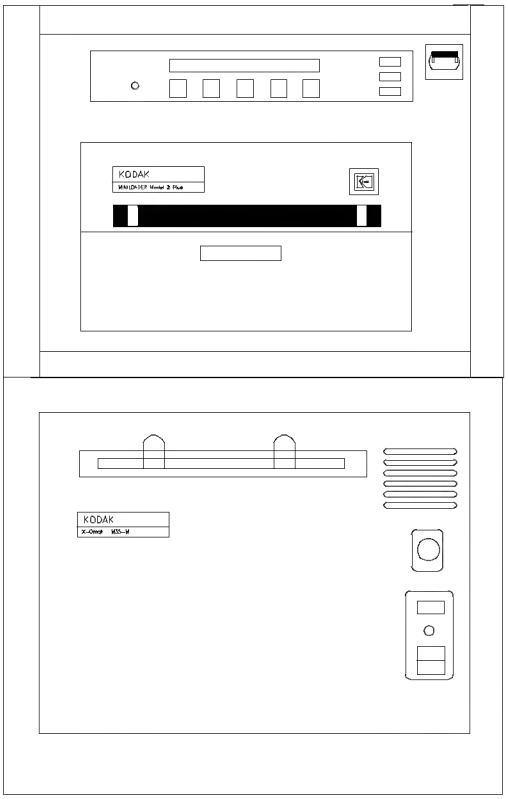
DRAFT ISSUE

SERVICE MANUAL

for the

Kodak MINILOADER 2 PLUS



Use this Publication for:-
MINILOADER 2 Plus Model Stand-alone (SV code 3236), MINILOADER 2 Plus Model M35-M (SV code 3239) and MINILOADER 2 Plus Model 480RA (SV code 3240).

HEALTH SCIENCES DIVISION

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CAUTION

This equipment includes parts and assemblies sensitive to damage from electrostatic discharge. Use caution to prevent damage during all service procedures.

PLEASE NOTE

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SPECIAL TOOLS

The following SPECIAL TOOLS are required for the MINILOADER 2 PLUS.

PART NO.	QUANTITY	DESCRIPTION
G 9901918	2	INTERLOCK OVERRIDE
9153003	1	STEP BY STEP SWITCH
30015675	1	PHOTOCELL ALIGNMENT TOOL M223
OR		
30015676	1	PHOTOCELL ALIGNMENT TOOL M228
30015677	1	CAM CLUTCH ADJUSTMENT TOOL
30026250	1	EXTENDER CABLE - PHOTOCELL FC2
30026251	1	EXTENDER CABLE - CUSTOMER KEYPAD
29010170	1	VACUUM GAUGE
29010188	1	ADAPTOR FOR VACUUM GAUGE
30015657	1	VACUUM TEST PIPE ASSEMBLY
9194531	1	REFLECTIVE PATCH POSITIONING TOOL
9194511	1	REFLECTIVE PATCH POSITIONING TOOL
TL 2431	1	AIR METER - FOR TESTING PROCESSOR VENT
29050132	1	HUMIDITY METER
HTL 885	1	VACUUM CLEANER
HTL 885G	1	SPARE BAGS FOR VACUUM CLEANER
HTL 1259	1	PRINTER (DICONIX - SERIAL)
HTL 1260	1	PRINTER POWER SUPPLY (U.K. ONLY)
HTL 1262	1	PRINTER CASE
29038395	1	PAPER FOR PRINTER
29030814	1	PRINTER INTERFACE CABLE
LOCAL SUPPLY	1	REPLACEMENT INK CARTRIDGE FOR PRINTER.
30026274	1	TOOL FOR SETTING ENCODER HOME POSITION

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RECOMMENDED SPARES FOR FIELD STOCK

PART NO	DESCRIPTION	QUANTITY
30012279	NOZZLE, CASSETTE INJECTOR	1
30012389	SUCKER, WITHOUT "O" RING	3
30012390	SUCKER, WITH "O" RING	1
30014207	AIR FILTER, INTERNAL (2+ MODELS 480RA & SA ONLY)	1
30014365	AIR FILTER, EXTERNAL (2+ MODEL 480RA & SA ONLY)	2
30015508	LINK, CONNECTING FOR CHAIN	1
30015525	CIRCLIP, E 6	1
30015526	CIRCLIP, E 10	1
30015527	CIRCLIP, E 12	1
30015529	CIRCLIP, I 26	1
30015531	E CLIP, M4	1
30015589	TUBE, FLEXIBLE, 5 x 3 MM (ORDER BY METRE)	1
30015606	REPAIR KIT, FOR COMPRESSOR	1
30015622	FOAM, LIGHT LOCK 20 X 10, (ORDER BY METRE)	1
30015911	CONNECTOR, PHOTOCELL PLUG	3
30025642	FUSE, 5 x 20 mm, T 1 AMP (BOTH 2+ & 2+LV)	2
30025643	FUSE, 5 x 20 mm, T 16 AMP (2+ ONLY)	2
30025644	FUSE, 5 x 20 mm, T 2 AMP (2+ ONLY)	2
30025645	FUSE, 5 x 20 mm, T 4 AMP (BOTH 2+ & 2+LV)	2
30025647	FUSE, 5 x 20 mm, T 6.3 AMP (LV ONLY)	2
30025648	FUSE, 5 x 20 mm, T 10 AMP (BOTH 2+ & 2+LV)	1
30025886	MULTIFUSE, R-250 (2+ ONLY)	1
30025887	MULTIFUSE, R-135 (2+ ONLY)	1
30025888	MULTIFUSE, R-050 (2+ ONLY)	1
30026192	FILTER, AIR (2+ M35-M MODEL ONLY)	1
30026677	FUSE, 5 x 20 mm, T315mA (LV ONLY)	2
30026664	MULTIFUSE, R-050 (LV ONLY)	1
30026665	MULTIFUSE, R-135 (LV ONLY)	1
30026666	MULTIFUSE, R-250 (LV ONLY)	1
9166451	FELT PAD KIT (FOR VIDEO CASSETTES)	1
9194551	REFLECTIVE FOIL 8 x 15 mm	1

PREVENTATIVE MAINTENANCE PROCEDURE

1. Discuss recent performance of the MINILOADER with the customer, check recently processed FILMS for ARTEFACTS and examine recent entries in the equipment LOG BOOK if appropriate. Check the modification and software status and order any modifications required.

2. Withdraw all the MAGAZINES. Reload SUPPLY MAGAZINES with TEST FILM. If the MINILOADER is a STAND-ALONE unit, fit an empty RECEIVING MAGAZINE.

3. Check CASSETTE REFLECTOR patches for position and condition and replace where necessary. It is advisable to replace the REFLECTORS on the outside of the CASSETTES every PM visit. If a HUMIDIFIER is fitted to the MINILOADER, clean the inside of the HUMIDIFIER and change the ELEMENT.

4. Remove the TOP COVER and both SIDE PANELS from the MINILOADER. If a HUMIDIFIER is fitted, clean it out using disinfectant or bleach and change the PAPER ELEMENT if necessary, the ELEMENT must be changed if it is more than 6 months old. The LABEL inside the HUMIDIFIER should be marked with the date of the ELEMENT change. Fit a new OUTER AIR FILTER element. Clean the SECONDARY FILTER (if fitted, depending on model) replacing if necessary.

5. Make two STATUS PRINTOUT using a SERIAL printer such as the KODAK DICONIX. Take note of any re-occurring faults, make a comparison with previous print-out and observe any adverse trends. Discard the old PRINTOUT, leave one PRINTOUT with the MINILOADER, and send the other PRINTOUT to your country specialist.

6. Remove the FRONT COVER. Take care to disconnect all the CABLES before attempting to move the COVER away from the MINILOADER.

7. Using a BRUSH and a VACUUM CLEANER, remove all dust and debris from inside the MINILOADER.

8. Check the PHOTOCELL REFLECTORS for security and cleanliness.

9. PROCESSOR INTERFACE models only. Polish the TUNNEL (and the CHUTE if the MINILOADER is a M35-M model) with a silicone based polish.

10. Thoroughly clean CASSETTE CONVEYOR BELT with alcohol, check the condition of the BELT and replace or adjust as necessary.

11. Check the condition of all HOSES and SUCKERS and replace if damaged. CAUTION - DO NOT HANDLE THE SUCKERS. Check the VACUUM to the SUCKERS (150 - 200 millibars) and adjust if necessary. NOTE - If the VACUUM is too high, film marking can result.

12. Check the COMPRESSOR reaches a minimum pressure of 2.0 bar. Correct if necessary.

13. Check CAM MOTOR CHAIN tension and adjust if necessary. If required, lightly lubricate the CHAIN with a thin oil such as TL 2244.

14. Re-fit the MAGAZINES and enter TEST MODE.

15. Go into MOTOR TEST and check that all MOTORS operate correctly.

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16. Ensure that CASSETTE GUIDES run smoothly, and lubricate pivots if necessary with a thin oil such as TL 2244.

17. Operate the MAGAZINE CARRIAGE MOTOR and if necessary lightly lubricate the CHAIN with a thin oil such as TL 2244.

18. Check the operation of 8" x 10" ENDSTOP and if necessary lubricate the PIVOTS with a thin oil such as TL 2244.

19. Enter SENSOR TEST, and using the correct PHOTOCELL TEST TOOL (either M223 or M228) check the alignment is correct for FC1 and FC4. Check the MAGAZINE open PHOTOCELLS operate correctly.

20. Lubricate the MAGAZINE TILT PIVOTS every PM with thin oil such as TL 2244.

21. Annually grease the CAMS with GREASE TL 2345.

22. Check the general security of PUSH RODS and MOTORS.

23. Check that the CONNECTORS on the PRINTED CIRCUIT BOARDS are secure.

24. Replace the FRONT COVER, making sure all the CABLES are routed correctly and check the operation of the CASSETTE ENTRY GUIDES.

25. Run some test cycles paying particular attention to :-

a) MAGAZINE FILM SEPARATION

b) MAGAZINE TILT ACTION

c) Correct delivery of new FILM into the CASSETTE

d) CASSETTE INJECTOR action

e) Correct release of the FILM into the CHUTE (or into the RECEIVING MAGAZINE on STAND-ALONE versions).

g) Check the MULTIPLE FILM DETECTOR FC8 is working correctly and adjust if necessary.

26. Note the reading on the CYCLE COUNTER.

27. Remove the TEST FILM from the MAGAZINES.

28. Replace all the COVERS and if possible process some LIVE film to check for artefacts. Fill in the equipment LOG BOOK (if supplied).

PHOTOCELLS

FC1 18 x 24 and 24 x 30 CASSETTES AT ENDSTOP, and FILM IN CASSETTE FOR 18 x 24 and 24 x 30
FC2 CASSETTE ENTERED
FC3 CASSETTE OPENED SIGNAL
FC4 FILM STUCK ON UPPER SCREEN (18 x 24 & 24 x 30 MAMMOGRAPHY CASSETTES ONLY)
FC5 SUPPLY MAGAZINE NEARLY EMPTY
FC6 SUPPLY MAGAZINE EMPTY, and SUPPLY MAGAZINE CODE 1
FC7 FILM IN UPPER CHUTE, (PROCESSOR INTERFACE VERSION ONLY)
or RECEIVING MAGAZINE FULL (STAND-ALONE VERSION ONLY)
and 8 x 10 CASSETTE NOT UNLOADED DETECTION
FC8 MULTIPLE FILM LOAD
FC9 FILM IN LOWER CHUTE (M35-M VERSION ONLY)
or RECEIVING MAGAZINE PRESENT (STAND-ALONE VERSION ONLY)
FC10 8 x 10 CASSETTE AT 8 x 10 ENDSTOP
FC11 NOT USED AT PRESENT
FC12 SUPPLY MAGAZINE CODE 2
and MAGAZINE EMPTY DETECTOR FOR A MINILOADER 1 MAGAZINE USED IN OPTIONAL ADAPTOR
FC13 8 x 10 CASSETTE NOT RELOADED PLUS MAMMOGRAPHY CASSETTE NOT LOADED WITH SOFTWARE VERSIONS 2.1 AND HIGHER AND ALL LOW VOLTAGE MACHINES.
FC14 RECEIVING MAGAZINE OPEN (STAND-ALONE VERSION ONLY)
FC15 VIDEO CASSETTE DETECTION (AFTER MODIFICATION M02 AND ALL LOW VOLTAGE MACHINES)
FC20 UPPER CARRIAGE SUPPLY MAGAZINE IS OPEN
FC21 LOWER CARRIAGE SUPPLY MAGAZINE IS OPEN

To check the PHOTOCELLS

a) Make sure the MAGAZINES do not contain customer FILM.

b) Remove the LID and the LEFT SIDE PANEL.

c) Insert an INTERLOCK OVERRIDE KEY (G 9901918) in the LID SWITCH.

d) Select "SENSOR TEST WITH SOUND" on the SWITCHES on PCB 303/403. Set the CONTROL SWITCH 2 to ON (1). See FIGURE 1.

e) Turn on the power to the MINILOADER. Press S18, the DISPLAY will now read "SENSOR TEST WITH SOUND", and when a PHOTOCELL changes state, the BUZZER will sound and the PHOTOCELL identification will be shown on the right side of the DISPLAY. The appropriate LED on PCB 303/403 will also change state (see FIGURE 1). The BUZZER will continue to sound until the PHOTOCELL returns to the original state.

f) Follow the instructions for each PHOTOCELL on the following pages.

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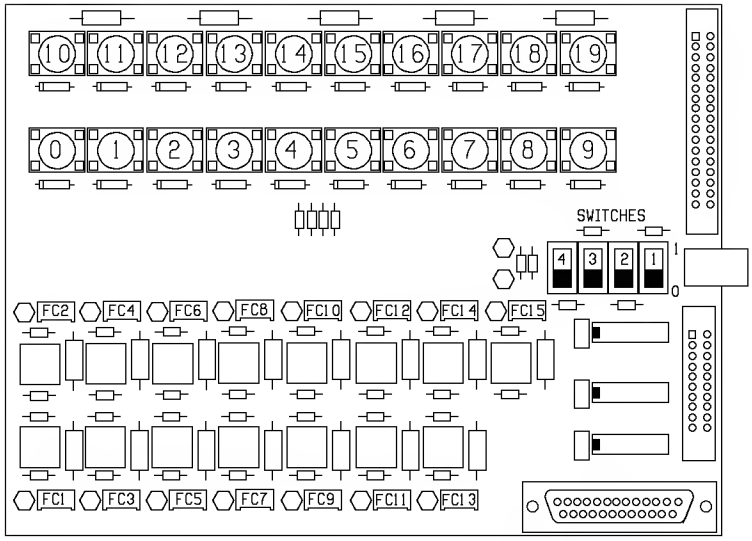
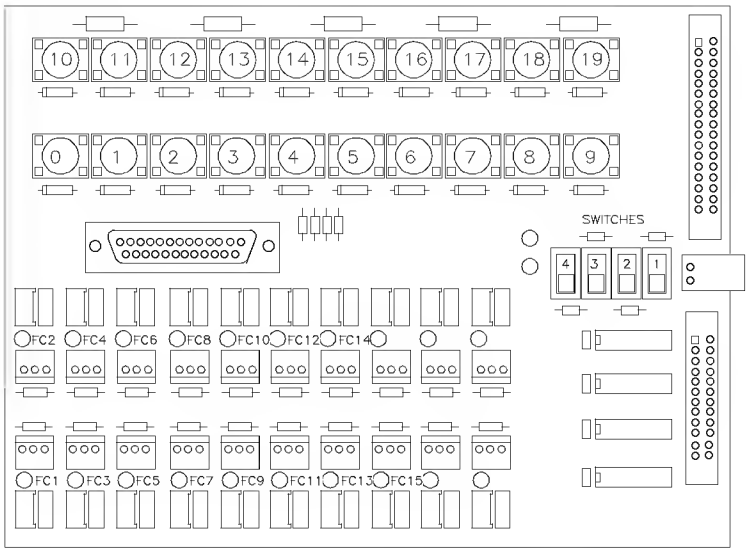


PCB 303

FITTED TO ORIGINAL MINILOADERS

FIGURE 1.



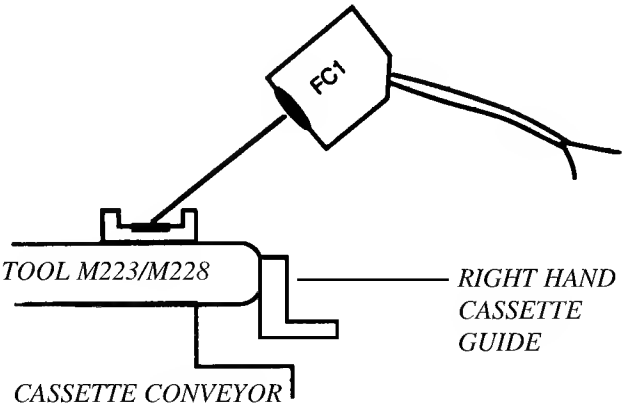
PCB 403

FITTED TO LOW VOLTAGE MINILOADERS

PHOTOCELL FC1

FOR MAMMOGRAPHY CASSETTES ONLY - CASSETTE AT ENDSTOP, AND FILM IN CASSETTE.

Select 18 x 24 size. Place TOOL M223 or M228 on the CASSETTE CONVEYOR BELT touching the ENDSTOP and the RIGHT CASSETTE GUIDE with the FC1 PATCH under the PHOTOCELL. The FC1 LED on PCB 303/403 should light, and the BUZZER should sound. FC1 should also show on the DISPLAY.



To obtain correct alignment of PHOTOCELL FC1, reduce the sensitivity of the PHOTOCELL AMPLIFIER on PCB 303/403, by turning the POTENTIOMETER counter-clockwise, then mechanically adjust the position of the PHOTOCELL so the LED lights again. Repeat this until the optimum position is reached.

To reset the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus five more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise four turns.

PHOTOCELL FC2

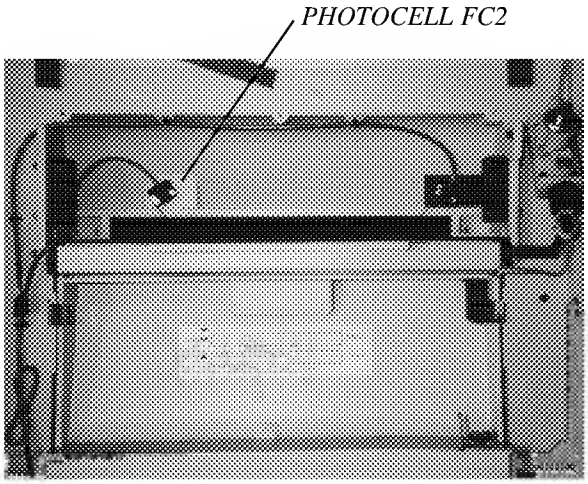
CASSETTE ENTERED.

The signal from PHOTOCELL FC2 is normally high, except when a CASSETTE is entered. Interrupting the path of the PHOTOCELL should turn off the LED on PCB 303/403 and sound the BUZZER. FC2 should be shown on the DISPLAY.

The alignment of the REFLECTOR for FC2 is factory set. Make sure the REFLECTOR is clean, and the MIRROR is in good condition.

To gain access to the PHOTOCELL FC2, the FRONT PANEL of the MINILOADER must be removed, and the ENTRY ROLLER COVER removed.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.



FRONT PANEL SHOWN WITH ENTRY ROLLER AND COVER REMOVED

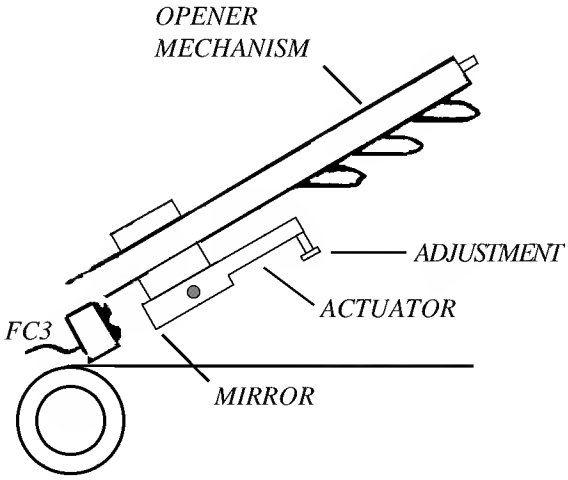
PHOTOCELL FC3

CASSETTE OPENED SIGNAL.

The signal from FC3 is normally high, until a CASSETTE is opened, and the MIRROR is moved away from the PHOTOCELL. The signal then goes low.

The PHOTOCELL must be set so a high signal is obtained when the ACTUATOR is not lifted by the CASSETTE LID. When the CASSETTE LID is lifted by the OPENER MECHANISM, the signal must go low.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.



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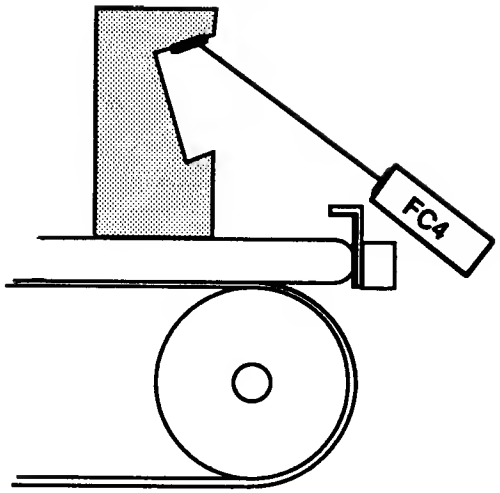
PHOTOCELL FC4

FILM STUCK TO UPPER SCREEN OF A MAMMOGRAPHY CASSETTE

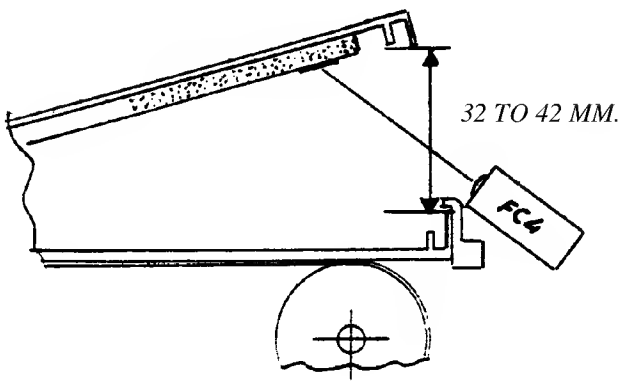
The signal from PHOTOCELL FC4 is normally low, except when a PATCH on the SCREEN of a MAMMOGRAPHY CASSETTE is seen by the PHOTOCELL.



Select 18 x 24 size. Place TOOL M223 or M228 on the CASSETTE CONVEYOR BELT touching the ENDSTOP and the RIGHT CASSETTE GUIDE with the FC4 PATCH facing the PHOTOCELL. The FC4 LED on PCB 303/403 should light, and the BUZZER should sound. FC4 should also show on the DISPLAY.

To obtain the correct alignment of PHOTOCELL FC4, reduce the sensitivity of the PHOTOCELL AMPLIFIER on PCB 303/403, by turning the POTENTIOMETER counter-clockwise, then mechanically adjust the position of the PHOTOCELL so the LED lights again. Repeat this until the optimum position is reached.

To reset the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.



It is important to set the alignment of FC4 using the TOOL, as individual CASSETTES will open a different amount, depending on the adjustment of the CASSETTE LATCH. However, as a check, a high signal should be seen from FC4 at some point when the CASSETTE is open between 32 and 42 mm. The PROGRAM actually checks the signal from FC4 at ENCODER STEP 43.

PHOTOCELL FC5.

SUPPLY MAGAZINE NEARLY EMPTY

The signal from PHOTOCELL FC5 is normally low, except when a SUPPLY MAGAZINE is nearly empty - approximately 8 FILMS left.

The PHOTOCELL can be checked by placing a REFLECTOR in the beam of the PHOTOCELL. The FC5 LED on PCB 303 should light, and if SENSOR TEST is selected the BUZZER should sound and FC5 should be shown on the DISPLAY.

There are two parts to the REFLECTOR for FC5. Part "A" is for the lower MAGAZINE (24 x 30 or 8 x 10 inch), and part "B" is for the 18 x 24 MAGAZINE. The PHOTOCELL must only be moved to adjust the setting for the 18 x 24, and the 18 x 24 adjustment MUST be made first.

To set the detector to operate at the correct level of FILMS in the SUPPLY MAGAZINE, proceed as follows. Load an 18 x 24 and either an 24 x 30 or an 8 x 10 SUPPLY MAGAZINE with 10 TEST FILMS. Enter MOTOR TEST MODE (press button 18 on PCB 303/403 once to go from SENSOR TEST to MOTORS AND SOLENOIDS TEST).

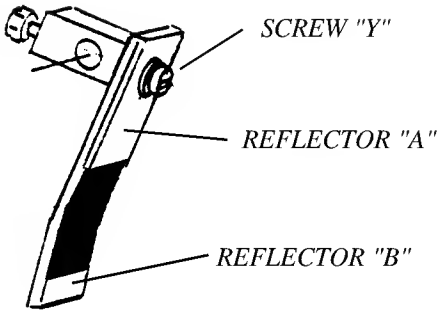
Send the 18 x 24 MAGAZINE to the rear of the machine (SWITCH 5). Drive the CAM MOTOR (SWITCH 0) forward until the STOP rests on the FILM. Adjust the position of the PHOTOCELL by means of the SCREWS "X" so the FC5 LED just lights on the bottom end of the REFLECTOR "B".

Drive the CAM MOTOR back to home position (SWITCH 1).
Send the lower MAGAZINE to the rear (SWITCH 4). Drive the CAM MOTOR forward (SWITCH 0) until the STOP rests on the FILM. Loosen SCREW "Y", and move REFLECTOR "A" so the FC5 LED just lights on the bottom edge of the REFLECTOR. IMPORTANT - **DO NOT MOVE THE PHOTOCELL WHILE ADJUSTING THE 24 x 30 SIZE, OR YOU WILL DESTROY THE SETTING FOR 18 x 24.**

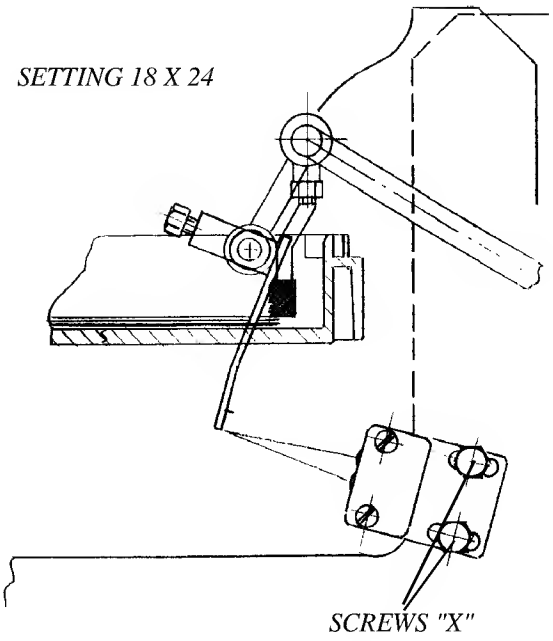
Leave TEST MODE, and install an 18 x 24 and a 24 x 30 MAGAZINE with about 12 FILMS in the MINILOADER. Run cycles until the "MAGAZINE NEARLY EMPTY" indication is given on both sizes. Count the FILMS left in the MAGAZINES. There should be between 6 and 10 FILMS left. If not, repeat the adjustment.

Normal sensitivity adjustment for FC5 is counter clockwise until the LED goes off, clockwise until the LED comes back on, plus three more turns.

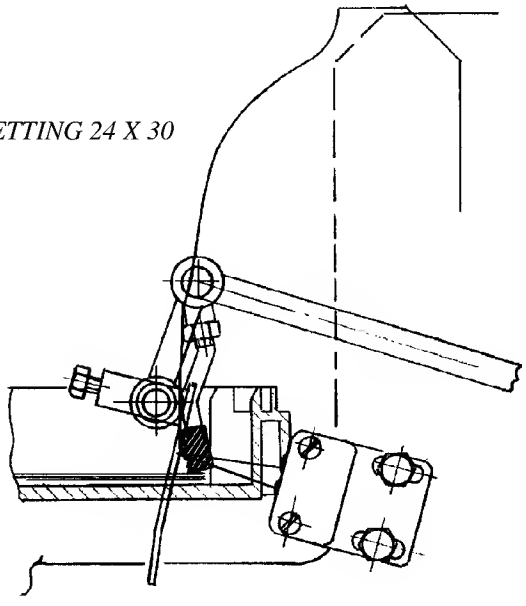
FC5 REFLECTOR



SETTING 18 X 24



SETTING 24 X 30



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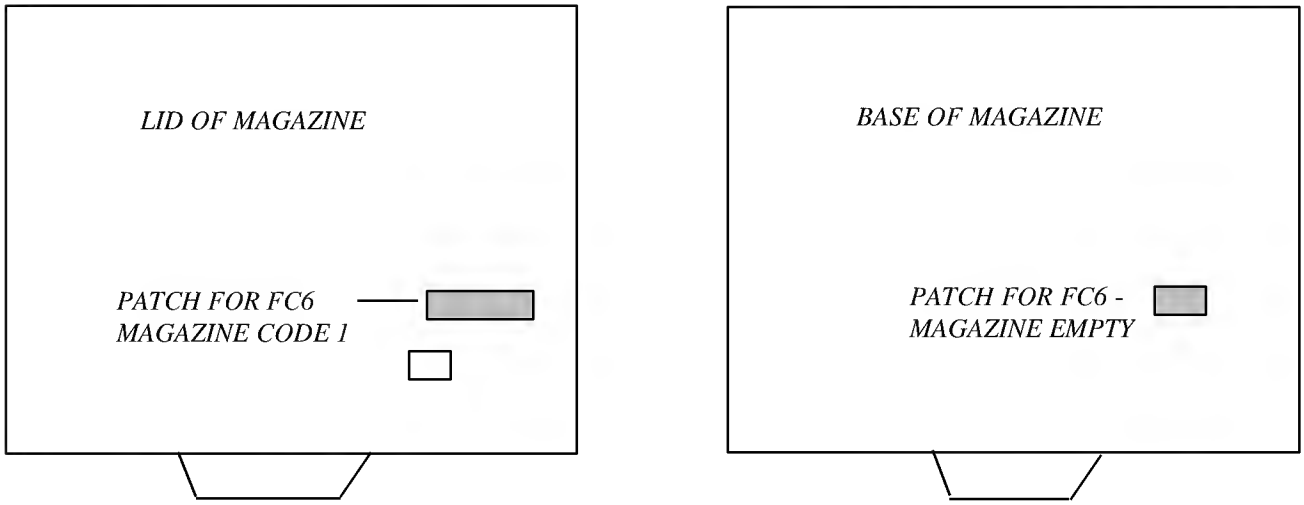
PHOTOCELL FC6.

SUPPLY MAGAZINE EMPTY and MAGAZINE CODE PART 1.

PHOTOCELL FC6 needs to be correctly aligned to detect both the PATCH on an 18 x 24 SERIAL MAGAZINE, and the PATCH in the base of all MAGAZINES for MAGAZINE EMPTY detection in both UPPER and LOWER CARRIAGES.



Place an empty 18 x 24 SERIAL MAGAZINE in the MINILOADER in the TOP CARRIAGE, and an empty 24 x 30 or 8 x 10" MAGAZINE in the LOWER CARRIAGE. Using TEST MODE, check with an IR PHOSPHOR PROBE (TL 2579) that the PHOTOCELL is adequately aligned with all **three** PATCHES. Change the mechanical alignment of the PHOTOCELL if necessary.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.

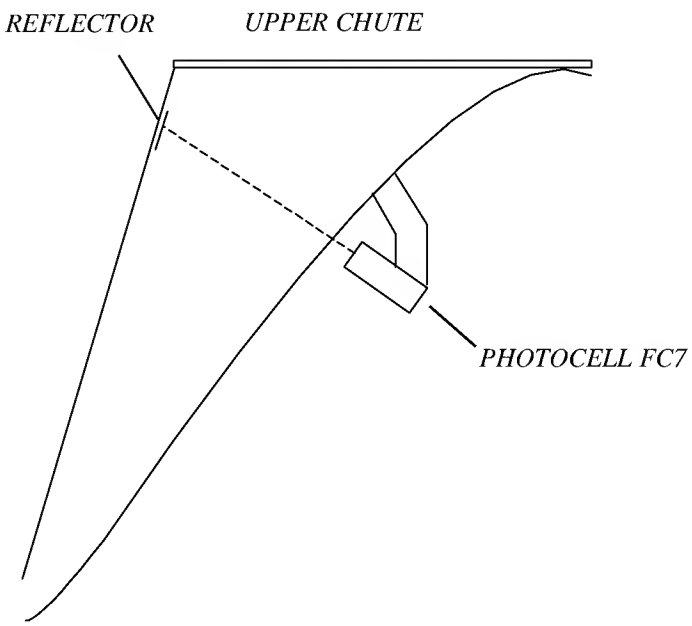
PHOTOCELL FC7.

FILM IN UPPER CHUTE in PROCESSOR INTERFACE VERSIONS and RECEIVING MAGAZINE FULL in STAND-ALONE VERSION.

FOR PROCESSOR INTERFACE MACHINES.

FC7 checks to see if the UPPER CHUTE is clear of FILMS 30 seconds after a cycle has been completed, and also before removing a FILM from a CASSETTE.

FC7 is also used to detect whether an 8 x 10 VIDEO CASSETTE has been unloaded.



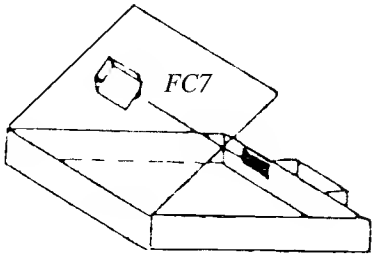
Using an IR PHOSPHOR PROBE (TL 2579) check that PHOTOCELL FC7 is looking at the centre of its reflector. If necessary, realign the PHOTOCELL.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.

FOR STAND-ALONE MACHINES.

The position of FC7 depends on whether the MINILOADER is set up to collect all size FILMS in one MAGAZINE, or to collect the 18 x 24 and 24 x 30 MAMMOGRAPHY FILMS in separate MAGAZINES.

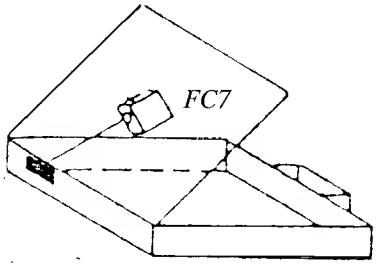
SEPARATE SIZE RECEIVING



For separate collection, FC7 should be adjusted so the PHOTOCELL goes low when there are more than 85 FILMS in the RECEIVING MAGAZINE.

For mixed collection, FC7 should be adjusted so the PHOTOCELL goes low when there are more than 70 FILMS in the RECEIVING MAGAZINE. This lower number is necessary because not all 18 x 24 FILMS may slide to the rear of the MAGAZINE.

MIXED SIZE RECEIVING



To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.

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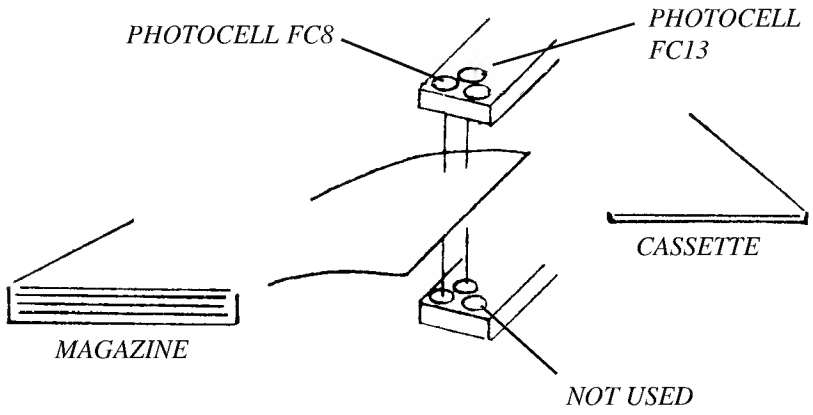
PHOTOCELL FC8.

MULTIPLE FILM LOAD DETECTION.

The physical alignment of PHOTOCELL FC8 is preset. However the angle and height of the SUPPORT BRACKET can be altered if the FILMS are catching on the DETECTOR.

The CAM MOTOR stops when the FILM is in the DETECTOR for a time of PARAMETER P3 seconds to allow the FILM to stabilise before the measurement is made.

It is not advisable to try to set the sensitivity of the PHOTOCELL by holding FILMS in it by hand as it is not possible to hold the FILM at the correct angle, and varying amounts of light will be reflected and transmitted.



IMPORTANT - ALL CHECKS OF THE MULTIPLE FILM DETECTOR MUST BE DONE USING FRESH FILM AND PREFERABLY IN LOW LIGHT CONDITIONS. THE DENSITY OF TEST FILM CHANGES WITH EXPOSURE TO LIGHT.

To check the setting of the PHOTOCELL, fit the STEP-BY-STEP SWITCH and run a normal cycle. When the CAM MOTOR stops for MULTIPLE FILM detection, operate the STEP-BY-STEP SWITCH to freeze the MINILOADER. The LED for FC8 should be off. Release the SWITCH and let the cycle complete.

Manufacture a DOUBLE FILM, preferably by using "SUPER GLUE" (CYANOACRYLATE adhesive) to stick the FILMS together. Repeat the test above, and now the FC8 LED should be on.

If SINGLE FILMS are detected as MULTIPLE LOADS, turn the FC8 POTENTIOMETER clockwise to increase the output of the EMITTER.

If DOUBLE FILMS are not detected, turn the FC8 POTENTIOMETER counter-clockwise to reduce the output of the EMITTER.

PHOTOCELL FC9.

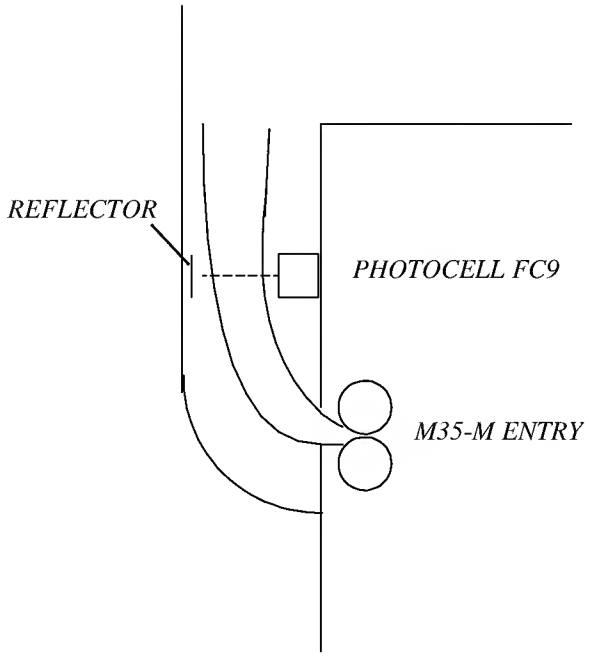
FILM IN LOWER CHUTE in M35-M VERSION and 18 x 24 RECEIVING MAGAZINE CODE in STAND-ALONE VERSION. NOT USED IN VERSION 480RA.

M35-M VERSION.

FC9 checks to see if the LOWER CHUTE is clear of FILMS 30 seconds after a cycle has been completed, and also before removing a FILM from a CASSETTE.

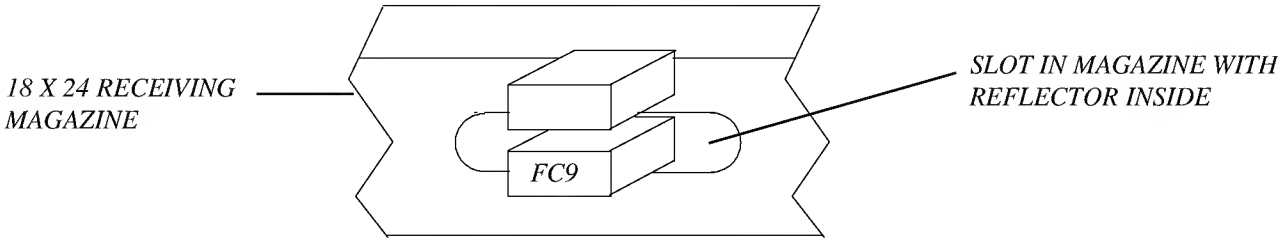
Using an IR PHOSPHOR PROBE (TL 2579) check that PHOTOCELL FC7 is looking at the centre of its reflector. If necessary, realign the PHOTOCELL.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.



STAND-ALONE VERSION.

In a STAND-ALONE MINILOADER which has been set up for separate collection of 18 x 24 and 24 x 30 MAMMOGRAPHY FILM, FC9 detects the presence of an 18 x 24 RECEIVING MAGAZINE.



Fit the 18 x 24 RECEIVING MAGAZINE to the MINILOADER. Using an IR PHOSPHOR PROBE (TL 2579) check that PHOTOCELL FC7 is looking at the centre of its reflector. If necessary, realign the PHOTOCELL.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.

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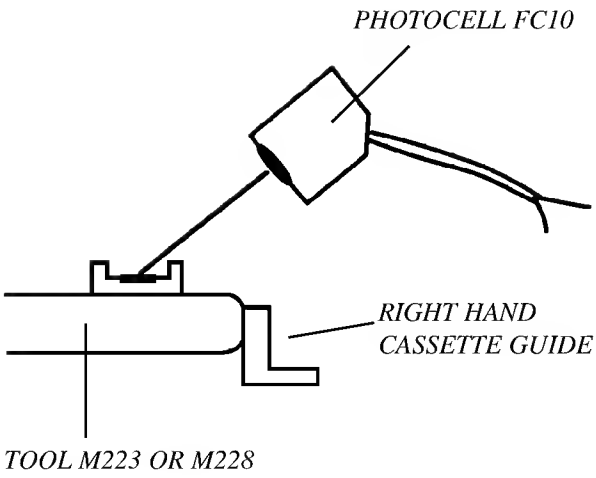
PHOTOCELL FC10

8 x 10 CASSETTE AT 8 x 10 ENDSTOP.

Select 8 x 10 size. Support the TOOL M223 or M228 in the position a CASSETTE would be in, touching the ENDSTOP and the RIGHT CASSETTE GUIDE with the FC1 PATCH under the PHOTOCELL. The FC10 LED on PCB 303 should light, and the BUZZER should sound. FC10 should also show on the DISPLAY.

To obtain correct alignment of PHOTOCELL FC10, reduce the sensitivity of the PHOTOCELL AMPLIFIER on PCB 303/403, by turning the POTENTIOMETER counter-clockwise, then mechanically adjust the position of the PHOTOCELL so the LED lights again. Repeat this until the optimum position is reached.



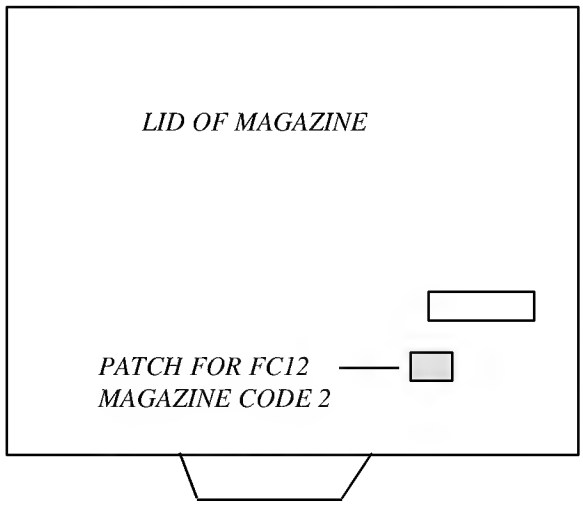
To reset the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.

PHOTOCELL FC12

SUPPLY MAGAZINE CODE 2 and MAGAZINE EMPTY FOR A MINILOADER 1 MAGAZINE USED IN OPTIONAL ADAPTOR.

Place a 24 x 30 SERIAL MAGAZINE in the MINILOADER in the LOWER CARRIAGE. Using TEST MODE, drive it to the rear of the MINILOADER and check with an IR PHOSPHOR PROBE (TL 2579) that the PHOTOCELL is adequately aligned with the PATCH. Change the mechanical alignment of the PHOTOCELL if necessary. If the optional ADAPTOR FRAME for a MINILOADER 1 MAGAZINE is in use on the machine, also check that the PHOTOCELL is detecting the MAGAZINE EMPTY PATCH in the MINILOADER 1 MAGAZINE.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.



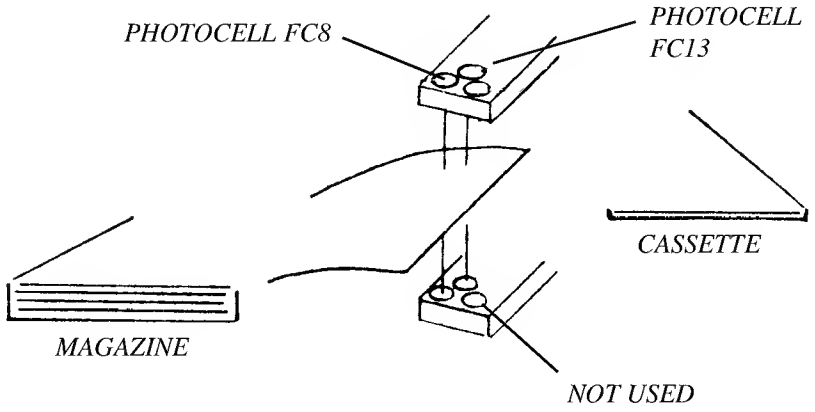
PHOTOCELL FC13.

8 x 10 VIDEO CASSETTE NOT RELOADED PLUS MAMMOGRAPHY CASSETTE NOT LOADED WITH SOFTWARE 2.1 AND HIGHER AND ALL LOW VOLTAGE MACHINES.

This PHOTOCELL is only used in cycles with 8 x 10 VIDEO FILMS. As the VIDEO CASSETTE has no REFLECTIVE PATCH inside, it is necessary to use this PHOTOCELL to detect if the CASSETTE has been reloaded.

The physical alignment of PHOTOCELL FC13 is preset. However, the angle and height of the SUPPORT BRACKET can be altered if the FILM catches on the DETECTOR.

When the CAM MOTOR stops at ENCODER STEP 158 for PHOTOCELL FC8 to check for a MULTIPLE FILM, PHOTOCELL FC13 is also checked to see if a FILM is present.

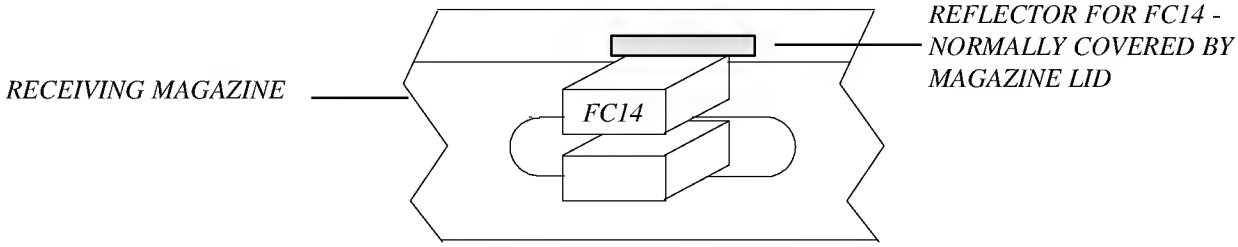


When no FILM is present in the DETECTOR, the FC13 LED should be on. To check the setting of the PHOTOCELL, fit the STEP-BY-STEP SWITCH and run a normal cycle. When the CAM MOTOR stops for MULTIPLE FILM detection, operate the STEP-BY-STEP SWITCH to freeze the MINILOADER. The LED for FC13 should be off. Release the SWITCH and let the cycle complete. If the PHOTOCELL did not turn off, reduce the sensitivity by turning the POTENTIOMETER half a turn counter-clockwise and repeat the test.

PHOTOCELL FC14.

RECEIVING MAGAZINE OPEN - STAND-ALONE VERSION ONLY.

PHOTOCELL FC14 detects if the RECEIVING MAGAZINE has remained open at the end of the cycle.



Fit a RECEIVING MAGAZINE to the MINILOADER. Open the MAGAZINE, place one FILM sticking out of the MAGAZINE and close the MAGAZINE LID on the FILM. Using an IR PHOSPHOR PROBE (TL 2579) check that PHOTOCELL FC14 is looking at the REFLECTOR. If necessary realign the PHOTOCELL.

To set the sensitivity of the PHOTOCELL, rotate the POTENTIOMETER counter-clockwise until the LED turns off, then clockwise until the LED lights plus three more turns. If the LED does not go off when rotating the POTENTIOMETER counter-clockwise because the end of the track is reached (a clicking sound is heard), just turn the POTENTIOMETER clockwise two turns.

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PHOTOCELL FC15.

VIDEO CASSETTE DETECTION - AFTER MODIFICATION M02 AND ALL LOW VOLTAGE MACHINES.

To prevent 8 x 10 inch VIDEO CASSETTES being entered into the MINILOADER when 24 x 30 size is selected (the CASSETTE would be jammed inside), a second PHOTOCELL (FC15) is added to the CASSETTE ENTRY area. PHOTOCELL FC15 was previously mounted in the MULTIPLE FILM DETECTOR ASSEMBLY, but it did not have any function.

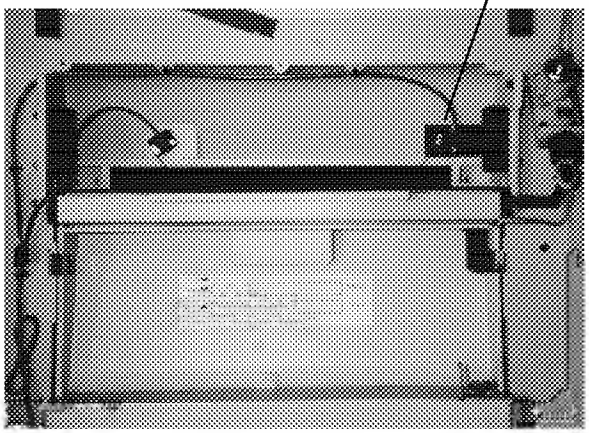
An 8 x 10 inch VIDEO CASSETTE needs a second REFLECTIVE STICKER when MODIFICATION 2 is active. When 8 x 10 inch VIDEO CASSETTE size is selected, PHOTOCELL FC15 looks for a second patch on the CASSETTE, and if the second patch is not present, the message "WRONG CASSETTE" is displayed and the MINILOADER will not start. This means that if the customer tries to enter a 24 x 30 CASSETTE, it will no longer be jammed inside the MINILOADER. IT IS IMPORTANT TO CHECK THAT NO OTHER CASSETTES HAVE A SECOND REFLECTIVE STICKER FITTED.

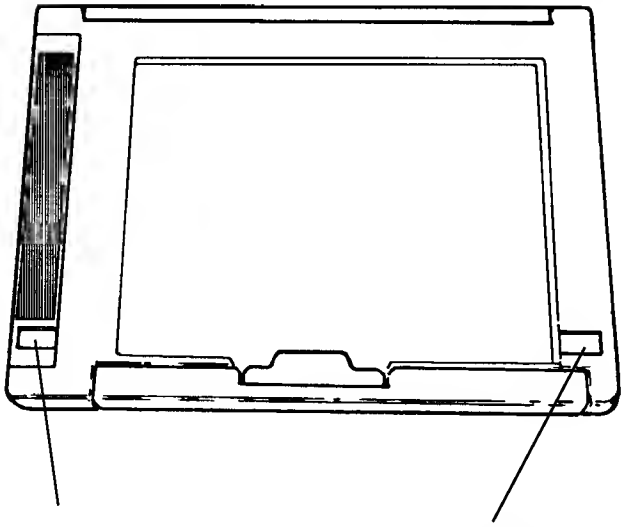
To make MODIFICATION 2 active, DIPSWITCH 6 on PCB 301 has to be turned ON. If your customer does not use the 8 x 10 VIDEO CASSETTE, you may not want to use this feature, as it causes a slight delay every time a CASSETTE is entered into the MINILOADER, while the CASSETTE is checked for a second STICKER.

To check the operation of the PHOTOCELL, select 8 x 10 operation, then enter TEST MODE. Push a VIDEO CASSETTE with the second PATCH fitted into the ENTRY SLOT. PHOTOCELL FC15 should turn off.

To set the sensitivity of the PHOTOCELL, enter TEST MODE, and then place an 8 x 10 VIDEO CASSETTE in the ENTRY SLOT so the PATCH is under FC15. Use an IR PHOSPHOR PROBE (TL 2579) to see the correct position. Turn the POTENTIOMETER anti-clockwise until the LED turns off. Then turn the POTENTIOMETER clockwise until the LED turn on, plus two more turns.

PHOTOCELL FC15





ALL CASSETTES MUST HAVE A PATCH ON THIS SIDE

IF MODIFICATION 2 IS ACTIVE, A SECOND PATCH MUST BE FITTED HERE.

PHOTOCELLS FC20 AND FC21

UPPER AND LOWER CARRIAGE SUPPLY MAGAZINE OPEN DETECTION.

These PHOTOCELLS detect if a SUPPLY MAGAZINE has remained open at the end of a cycle, and they will inhibit the MAGAZINE CARRIAGE from driving, as damage could be caused.

IMPORTANT - unlike all other PHOTOCELLS, FC20 & FC21 do not connect to PCB 303/403, they are connected to PCB 205. The PHOTOCELLS control the MAGAZINE CARRIAGE INHIBIT RELAY K23 directly. They also send a signal FC20/21 to the MICROPROCESSOR to warn of the MAGAZINE open condition.

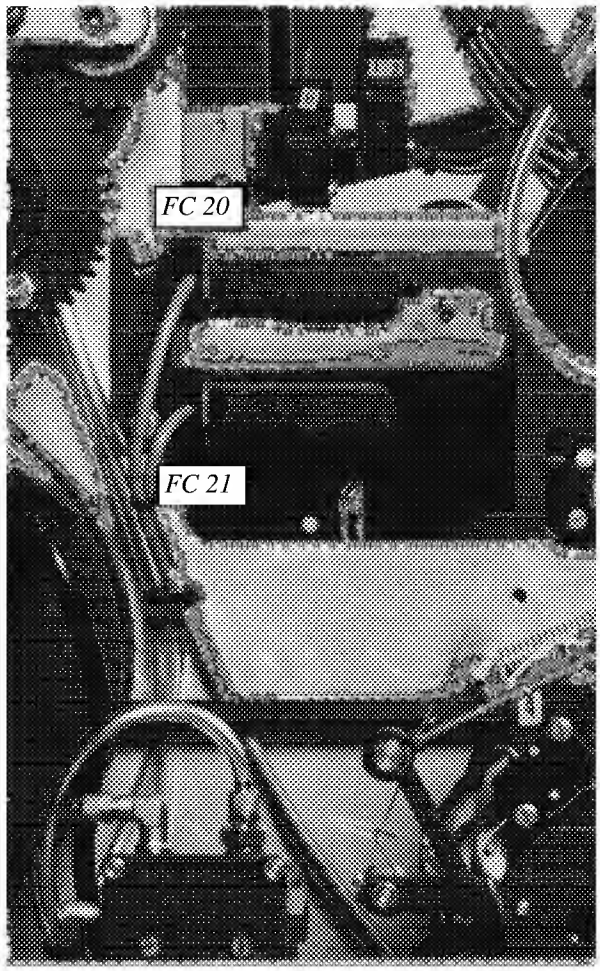
To test the PHOTOCELLS, drive an 18 x 24 SUPPLY MAGAZINE in the UPPER CARRIAGE, to the REAR of the MINILOADER. Open the MAGAZINE, place one FILM sticking out of the MAGAZINE and close the MAGAZINE LID on the FILM. The FC20 LED on PCB 205 should light.

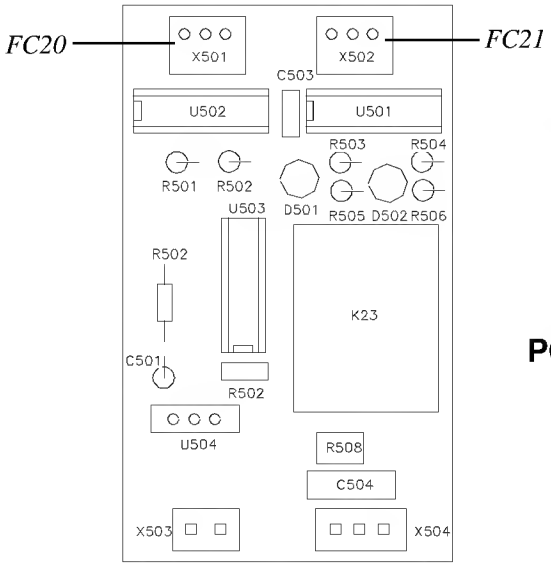
Repeat the test with a 24 x 30 MAGAZINE in the LOWER CARRIAGE. The FC21 LED on PCB 205 should light.

If the either LED did not light, it may be necessary to realign the PHOTOCELLS. However, before moving the PHOTOCELLS, check the REFLECTOR on the edge of the MAGAZINE is clean and in good condition. It is possible to use an IR PHOSPHOR PROBE (TL 2579) to see if the PHOTOCELL is aligned correctly.

These two photocells do not have any sensitivity adjustment.

It is very important that these two PHOTOCELLS operate correctly, because severe damage could be caused to the MINILOADER if the MAGAZINE CARRIAGE is driven while a MAGAZINE is not completely closed.





PCB 205

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SUPPLY MAGAZINE CODES.

PHOTOCELLS FC6 and FC12 are used in combination with MICROSWITCHES MS1 and MS2 to determine the size and type of MAGAZINE fitted to the MINILOADER.

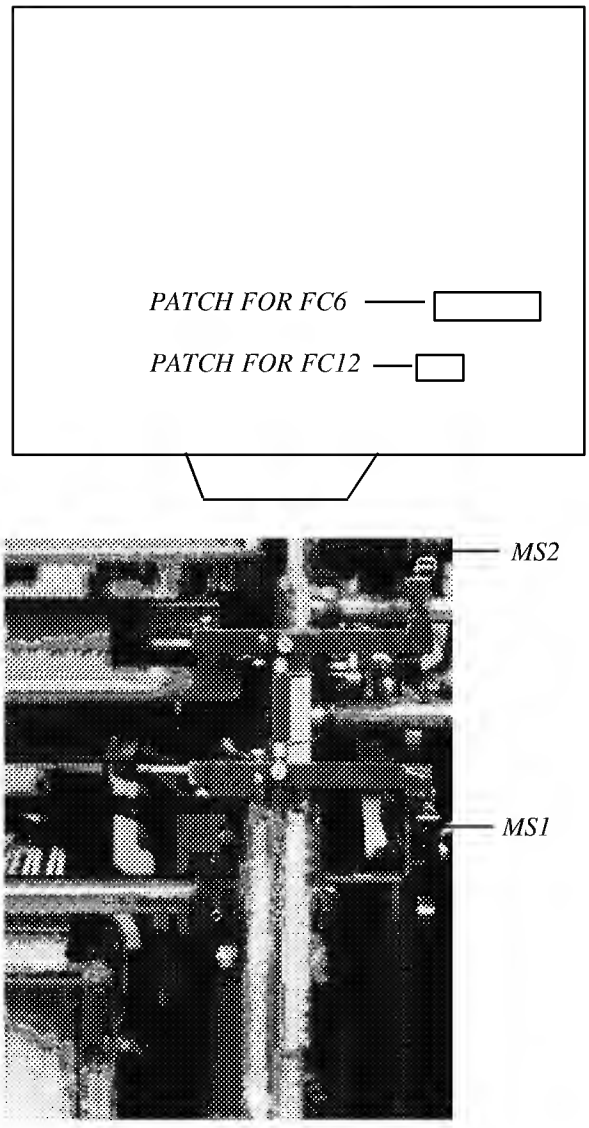
For the UPPER MAGAZINE CARRIAGE, FC6 determines whether the MAGAZINE is standard or serial 18 x 24 type.

For the LOWER MAGAZINE CARRIAGE, FC6 and FC12 determine whether the MAGAZINE is standard or serial 24 x 30 type, or 8 x 10 inch.

MICROSWITCH MS2 is only made when an 18 x 24 standard or serial MAGAZINE is in position at the rear of the MINILOADER in the UPPER MAGAZINE CARRIAGE.

MICROSWITCH MS1 is only made when an 24 x 30 standard or serial MAGAZINE, or a 8 x 10 inch MAGAZINE is in position at the rear of the MINILOADER in the LOWER MAGAZINE CARRIAGE.

The TABLE shows how the size determination is carried out.



SUPPLY MAGAZINE CODES

SIZE	FC6	FC12	MS1	MS2	MS8	MS9	Mag open signal	Mag empty signal
18 x 24 Mammo.	OFF	OFF	OFF	ON	ON	ON	FC20	FC6
18 x 24 Mammo. Serial	ON	OFF	OFF	ON	ON	ON	FC20	FC6
24 x 30 Mammo.	OFF	OFF	ON	OFF	ON	OFF	FC21	FC6
24 x 30 Mammo. Serial	OFF	ON	ON	OFF	ON	OFF	FC21	FC6
8 X 10 Video (CRT)	ON	OFF	ON	OFF	ON	OFF	FC21	FC6
Miniloader 1 Magazine in optional adaptor	ON	OFF	OFF	ON	ON	ON	NONE	FC12

SETTING THE ENCODER HOME POSITION.

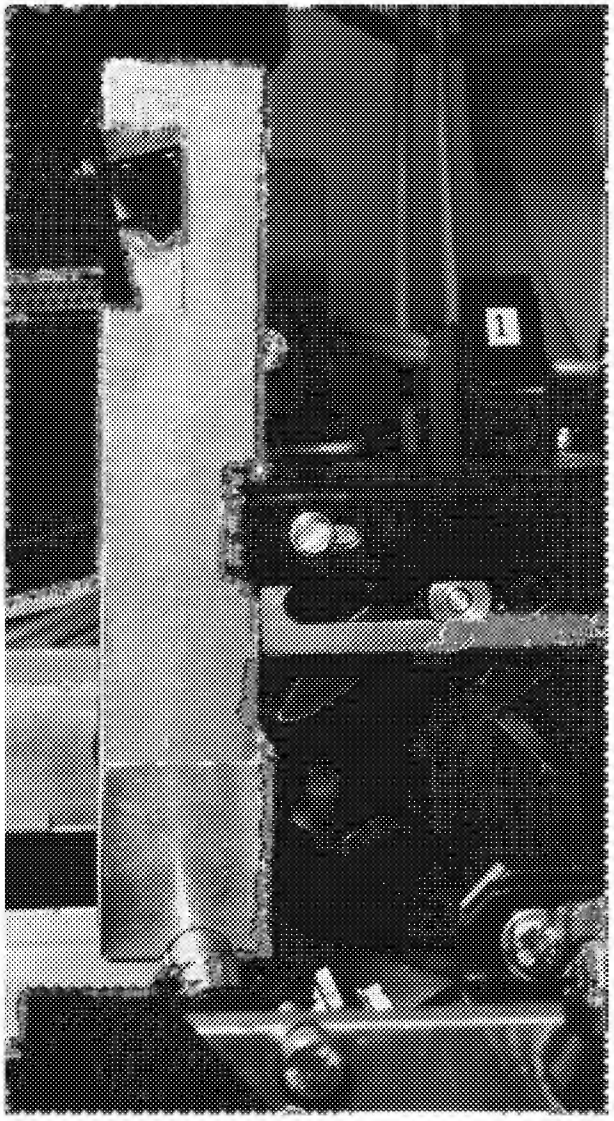
The ROTARY ENCODER controls the timing of the MINILOADER cycle. There are 256 (000 to 255) ENCODER STEPS in a 360 degree rotation of the CAM SYSTEM. The true ENCODER HOME POSITION is at STEP 255. A TOOL (30026274) is required to set the ENCODER HOME POSITION. The TOOL has two CUTOUTS, the first CUTOUT is used to set the low position of the CASSETTE OPENER MECHANISM as shown in FIGURE A. It is necessary to check this low position first as the HOME POSITION is related to it.

Using TEST MODE, drive the CAM MOTOR so the CASSETTE OPENER MECHANISM is in it lowest position. For getting this low position, it may be helpful to move the CAM SYSTEM using the CAM CLUTCH ADJUSTING TOOL (30015676) by hand.

Then, using the POSITION TOOL as shown, check that the end of the OPENER MECHANISM at the height indicated by the CUTOUT. If the OPENER MECHANISM is not in the CUTOUT, adjust the PUSHROD connected to the OPENER to set the end of the OPENER MECHANISM in the CUTOUT.

If a PUSHROD adjustment is required, repeat the check afterwards to ensure the setting is correct.

FIGURE A



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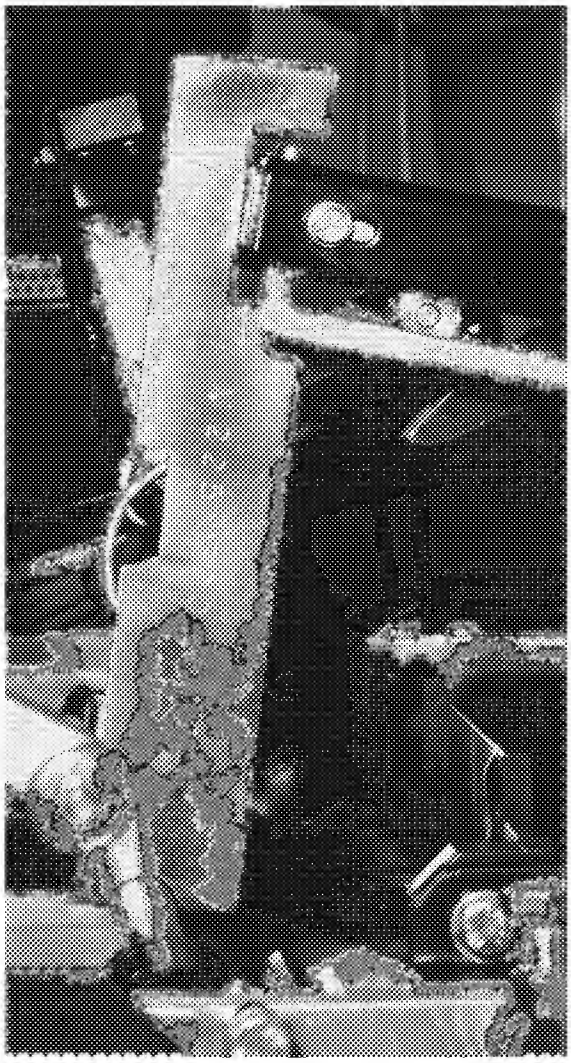
Still in TEST MODE, drive the CAM MOTOR to ENCODER POSITION 255 as shown on the DISPLAY.

Using the other CUTOUT in the TOOL, check that the end of the OPENER MECHANISM is between the edges of the CUTOUT as shown in FIGURE B.

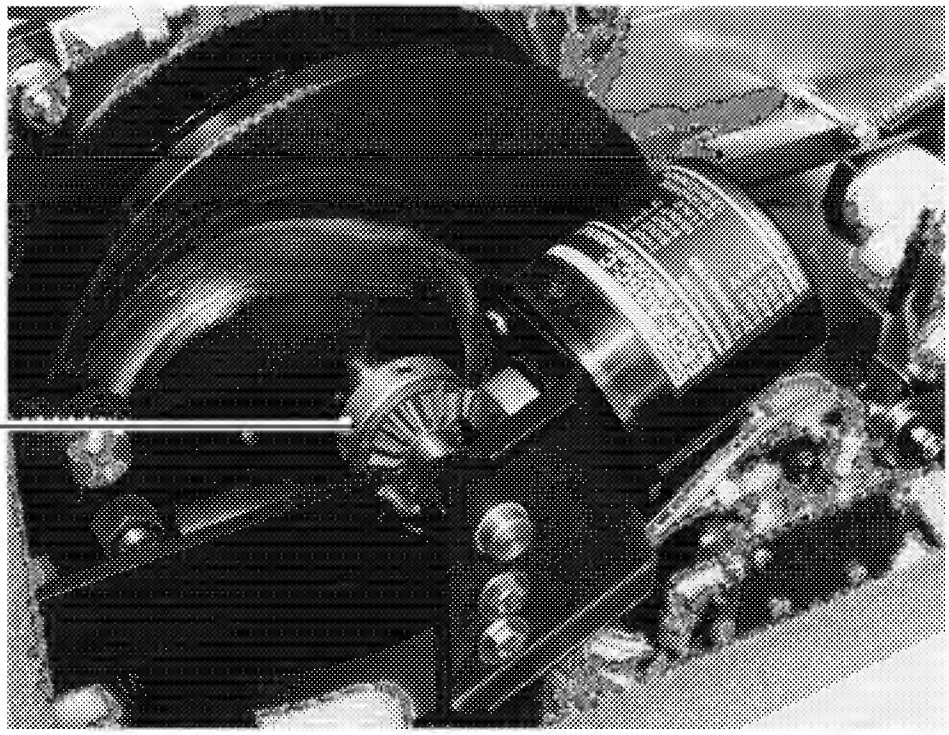
If the end of the OPENER MECHANISM is not between the EDGES of the CUTOUT, set it to the CENTRE of the CUTOUT by driving the CAM MOTOR, or using the CAM CLUTCH ADJUSTING TOOL (30015676). Remember that when the CAM SYSTEM is close to HOME POSITION (in the HOME POSITION WINDOW as shown by the LED on PCB 303/403 see FIGURE D) it is not possible to drive the CAM MOTOR in reverse.

FIGURE B



Once the OPENER MECHANISM is centred in the CUTOUT, loosen the GRUB SCREWS in the GEAR on the CAMSHAFT and rotate the GEAR until STEP 255 is shown on the DISPLAY. See FIGURE C. Re-tighten the GRUB SCREWS in the GEAR. Make sure you do not introduce BACKLASH into the GEARS.

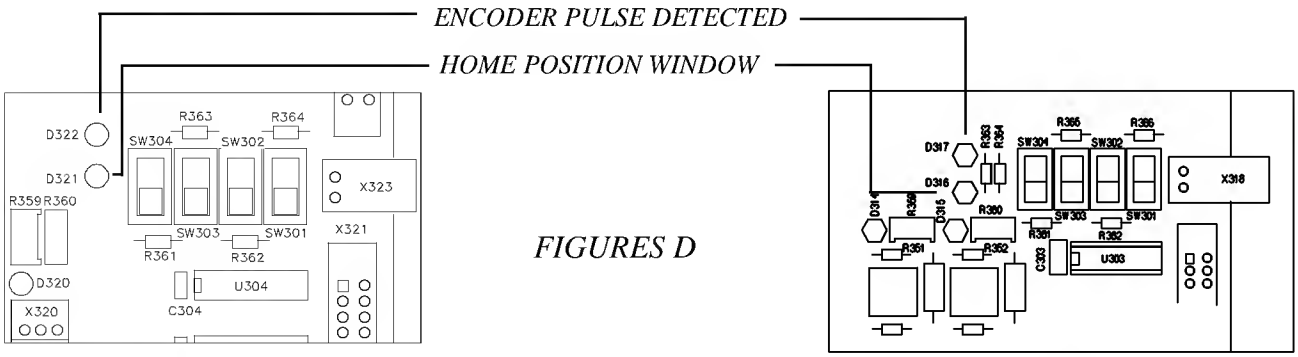
FIGURE C



After re-tightening the GRUB SCREWS, drive the CAM SYSTEM through a complete cycle, stopping frequently and checking for BACKLASH in the ENCODER GEARS - watch the DISPLAY while attempting to move the gears by hand. There should never be more that one STEP of BACKLASH.

ENCODER LED's ON PCB 303/403.

There are two ENCODER LED's on PCB 303/403. The UPPER LED D317 [D322 on PCB403] (MICROPROCESSOR OUTPUT EN1), illuminates every time an ENCODER PULSE is detected. The other LED D316 [D321 on PCB403] (MICROPROCESSOR OUTPUT EN0) illuminates when the HOME POSITION WINDOW (STEP 253 - 002) is reached. This WINDOW is only an indication that the CAM SYSTEM is near HOME POSITION, it is not the true HOME POSITION which is at ENCODER STEP 255. When LED D316 [D321 on PCB403] is on, it is not possible to drive the CAM MOTOR in reverse in TEST MODE.



FIGURES D

PCB 403 PCB 303

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CASSETTE INJECTOR ADJUSTMENT.

ADJUSTING THE POINT AT WHICH THE CASSETTE INJECTOR OPERATES.

In every cycle, the CASSETTE INJECTOR blows air to separate the FILM from the SCREEN of the CASSETTE. It is important that the blow occurs when the CASSETTE is open between 10 and 20 mm. If the CASSETTE is open less the INJECTOR will not operate correctly, if the CASSETTE is open more, the dislodged FILM will not fall accurately into the BASE of the CASSETTE.

It is possible to set the point at which the INJECTOR OPERATES by adjusting the appropriate "AIR BLOW CASSETTE OPENING" PARAMETER. These PARAMETERS control the ENCODER STEP at which the CAM MOTOR will stop for the INJECTOR to operate.

Set the MINILOADER for 18 x 24 FORMAT. Fit the STEP-BY-STEP SWITCH. Enter an 18 x 24 CASSETTE into the MINILOADER. When the CAM MOTOR stops for the CASSETTE INJECTOR to operate, trigger the STEP-BY-STEP SWITCH to freeze the machine. Measure how far the CASSETTE is open. Release the STEP-BY STEP SWITCH and complete the cycle.

Set the MINILOADER for 24 x 30 FORMAT. Repeat the operation as above.

If either CASSETTE was not open approximately 15 mm, the "AIR BLOW CASSETTE OPENING" PARAMETER for that size needs to be adjusted. If the CASSETTE was open too far, the PARAMETER needs to be reduced, if the CASSETTE was not open far enough, the PARAMETER needs to be increased.

If it is necessary to adjust the PARAMETER, enter PROGRAMMING MODE. Scroll through until PARAMETER P8 "AIR BLOW CASSETTE OPENING 18 x 24" is reached. Adjust the PARAMETER P8 to the appropriate figure. The DEFAULT value is 30, the allowable RANGE is between 26 and 32.

Go to PARAMETER P9 "AIR BLOW CASSETTE OPENING 24 x 30". Set the PARAMETER P9 to the appropriate figure. The DEFAULT value is 30, the allowable RANGE is between 26 and 32.

If you have altered the PARAMETERS, repeat the tests above and measure how much the CASSETTE is open. If necessary repeat the adjustment procedure of the PARAMETERS until the correct CASSETTE opening is achieved.

It is advisable to make a note of the PARAMETERS you have set inside the MINILOADER. If the machine is not used for some time, the back up BATTERY may discharge, and the PARAMETERS will return to the DEFAULT value.

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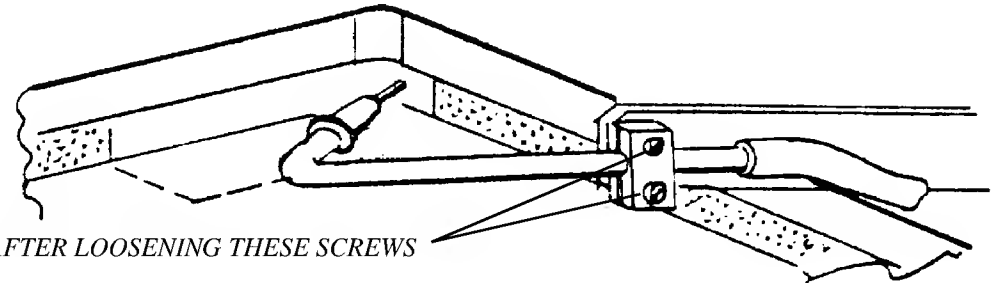
ADJUSTING THE POSITION OF THE CASSETTE INJECTOR.

The CASSETTE INJECTOR must blow the FILM from the CASSETTE SCREEN. To test the setting of the INJECTOR, stick a FILM to the SCREEN of a CASSETTE. Fit the STEP-BY-STEP SWITCH, and enter the CASSETTE into the MINILOADER. When the CAM stops for the INJECTOR to blow, operate the STEP-BY-STEP SWITCH to freeze the machine.

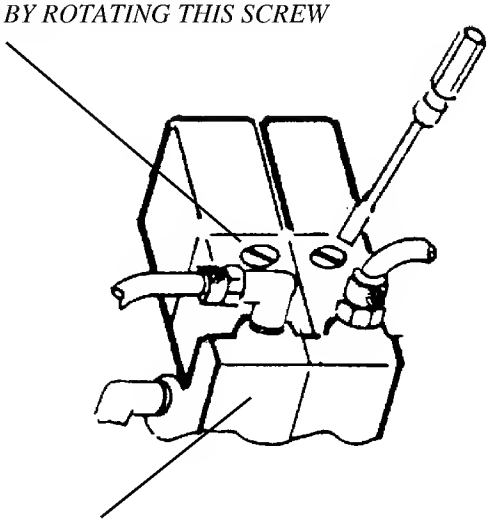
If the INJECTOR has stopped blowing, manual control of the SOLENOID VALVE can be obtained by rotating the SCREW as shown below. IMPORTANT, do not forget to set the SCREW BACK TO ELECTRICAL OPERATION AFTERWARDS.

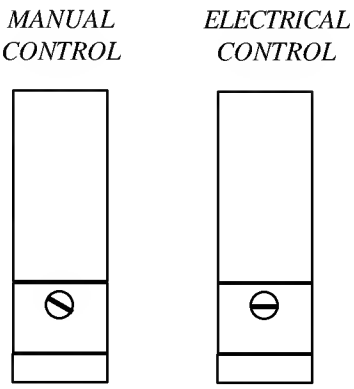


ADJUST AFTER LOOSENING THESE SCREWS

Adjust the angle of the CASSETTE INJECTOR by loosening the SCREWS, so it is effective at blowing the FILM from the CASSETTE SCREEN.

MANUAL CONTROL OF THE SOLENOID VALVE CAN BE OBTAINED BY ROTATING THIS SCREW





SOLENOID VALVE SV1 - CASSETTE INJECTOR

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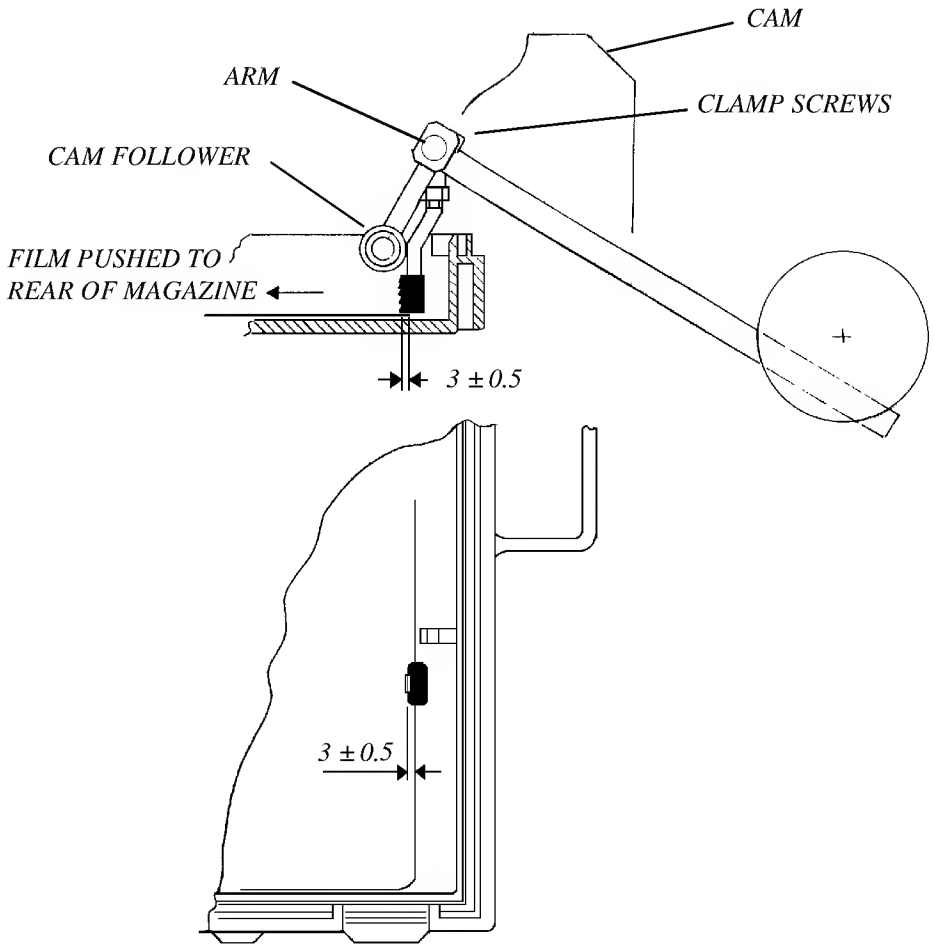
MAGAZINE INJECTOR ADJUSTMENT.

The MAGAZINE INJECTOR and STOP must be set correctly to obtain good separation of FILMS from the MAGAZINE. There are two parts to the adjustment of the MAGAZINE INJECTOR BAR, firstly the STOP must be set the correct distance onto the FILM, then the INJECTOR must be set at the correct angle and height.

The first setting is made with an 18 x 24 MAGAZINE containing one FILM. It is important that this film is pushed to the rear of the MAGAZINE. During the adjustment, make sure that the film stays pushed to the rear of the MAGAZINE.

Using TEST MODE drive the MAGAZINE INJECTOR BAR into the MAGAZINE. The STOP must overlap the edge of the FILM by 3 ± 0.5 mm. If the STOP is not in the correct position, it can be adjusted by loosening the CLAMP SCREWS and rotating the ARM.

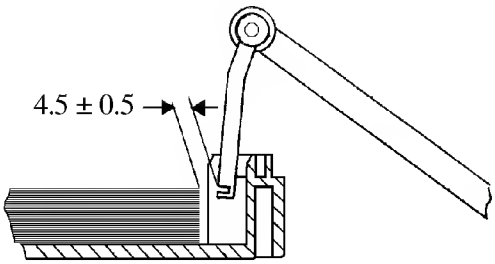


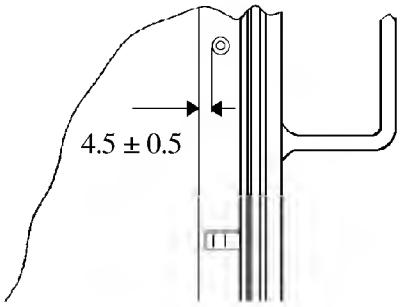
When this adjustment has been made, it should be checked using a full 18 x 24 MAGAZINE in the UPPER CARRIAGE and a 24 x 30 MAGAZINE containing one FILM in the LOWER CARRIAGE. At both extremes, the STOP must remain in the range of 3 ± 0.5 mm onto the FILM. Remember the FILM should always be pushed to the rear of the MAGAZINE.

If the setting cannot be maintained through the range, it may be necessary to alter the position of the CAM. The original position of the CAM was factory set, so consider carefully before altering it. If you intend to move the CAM, ensure you carefully mark its original position before moving it, so the original position can be reset if the adjustment is not successful.

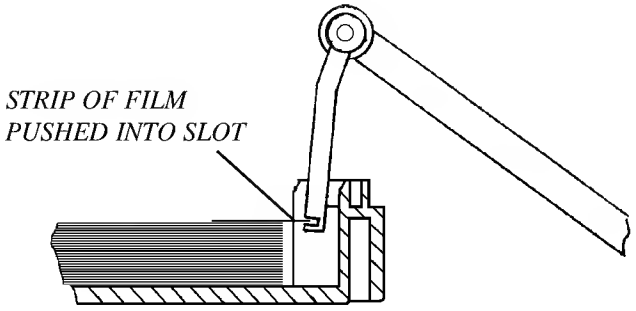
Once the STOP has been correctly set, the angle and height of the INJECTOR can be set.

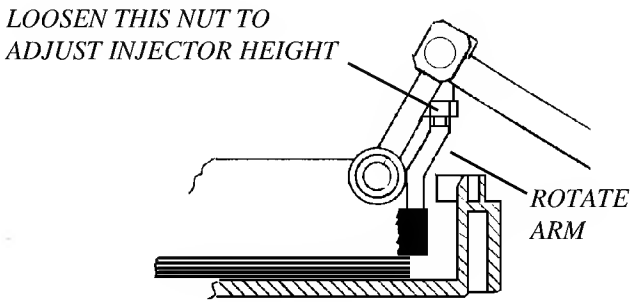
There should be a gap of 4.5 ± 0.5 mm between the INJECTOR and the FILM STACK. Check this setting throughout the range of a full 18 x 24 MAGAZINE to a nearly empty 24 x 30 MAGAZINE as before. The INJECTOR is threaded into the end of the INJECTOR BAR, and its position can be altered by careful rotation.





The height of the INJECTOR is adjusted by loosening the NUT and turning the STOP ARM in or out as required. The rough setting is obtained by sliding a strip of FILM over the top of the FILM STACK. The strip of FILM should go into the SLOT in the INJECTOR. A final setting can only be obtained by testing the MINILOADER with MAGAZINES of both sizes filled with varying quantities of FILM. Some compromise of setting may need to be made to obtain satisfactory separation of FILM throughout the operating range. While testing the machine, it is useful to press the edges of the FILMS in the MAGAZINE together using an "IRONING" motion. This better simulates the fresh FILMS in the MAGAZINE in normal use.





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ADJUSTMENT OF THE CASSETTE OPENER SYSTEM.

The CASSETTE OPENER MECHANISM is operated by two CAMS and two PUSH RODS. The first part of the adjustment procedure is to check that the lowest position of the CASSETTE OPENER MECHANISM is correct.

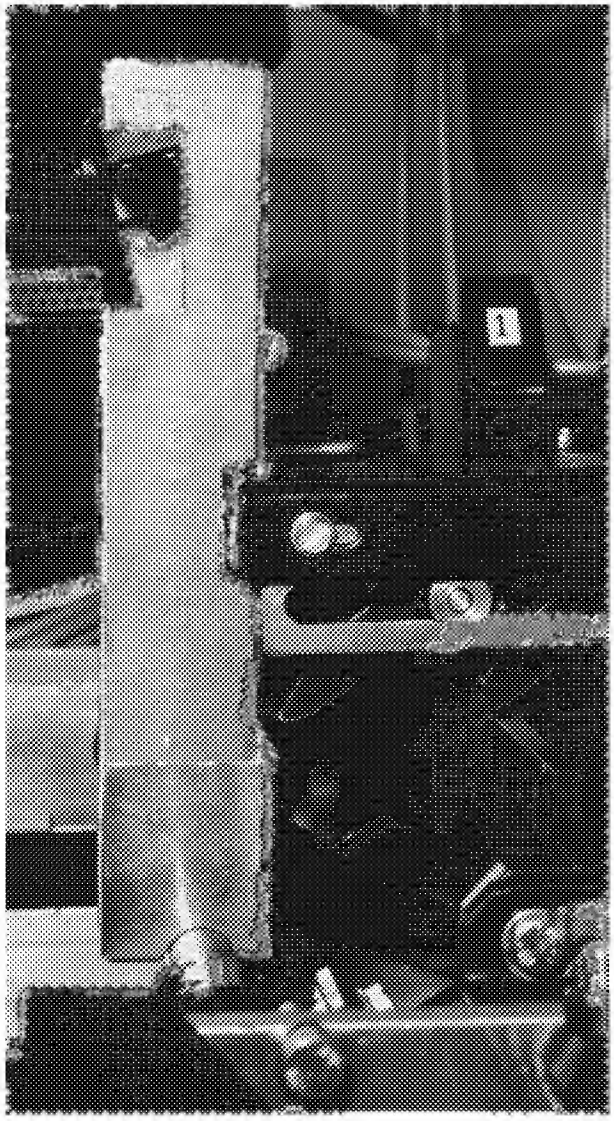
A TOOL (30026274) is used to set the low position. The TOOL has two CUTOUTS, the first CUTOUT is used to set the low position of the CASSETTE OPENER MECHANISM as shown in FIGURE A.

Using TEST MODE, drive the CAM MOTOR so the CASSETTE OPENER MECHANISM is in it lowest position. For getting this low position, it may be helpful to move the CAM SYSTEM using the CAM CLUTCH ADJUSTING TOOL (30015676) by hand.

Then, using the POSITION TOOL as shown, check that the end of the OPENER MECHANISM at the height indicated by the CUTOUT. If the OPENER MECHANISM is not in the CUTOUT, adjust the PUSHROD connected to the OPENER to set the end of the OPENER MECHANISM in the CUTOUT.

If a PUSHROD adjustment is required, repeat the check afterwards to ensure the setting is correct.

FIGURE A

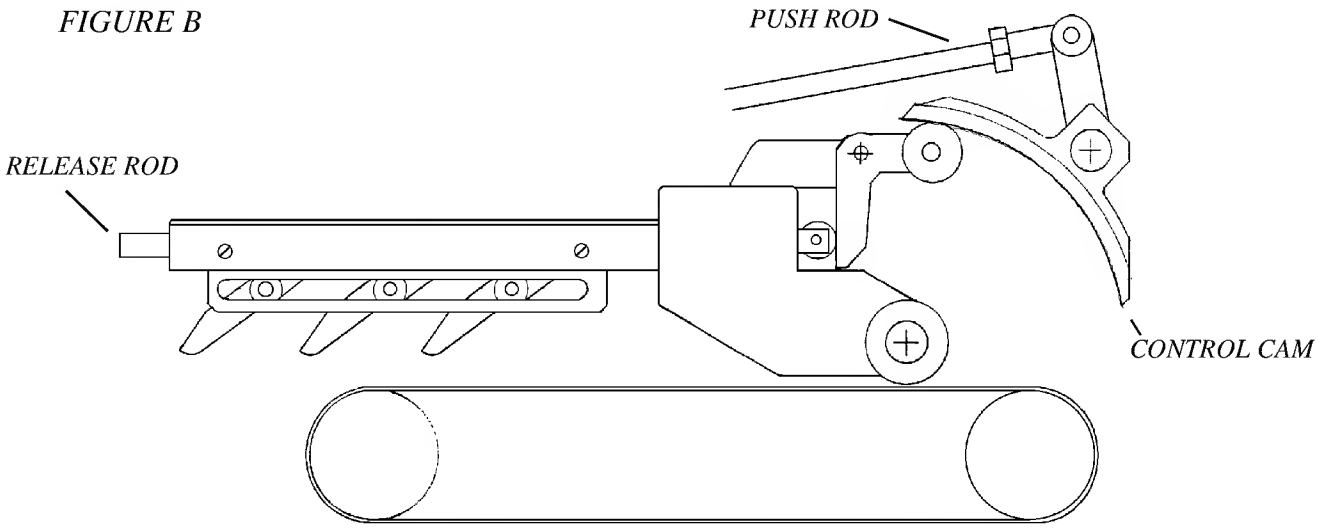


ADJUSTMENT OF THE CASSETTE OPENER SYSTEM CONTINUED.

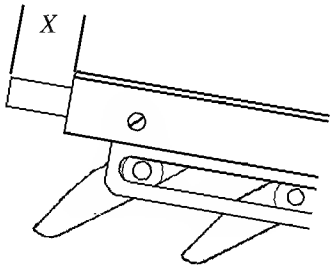
To adjust the second PUSH ROD, drive the CAM MOTOR backwards and forwards in TEST MODE and observe the movement of the RELEASE ROD (see Fig B). After the initial forward movement of the RELEASE ROD which unlatches the CASSETTE, there should be no further forward movement, and the RELEASE ROD should have retracted by approximately 2 mm when the CASSETTE OPENER MECHANISM reaches its highest position. This adjustment is important because if set incorrectly either the CASSETTE LID can be dropped, or the rear of the CASSETTE can be lifted off the CASSETTE CONVEYOR BELT causing difficulties in loading a new FILM into the CASSETTE.

If the RELEASE ROD does not retract by 2 mm, adjust the PUSH ROD to change the angle of the CONTROL CAM, to obtain the correct movement.

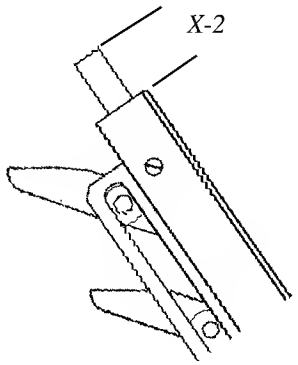
FIGURE B



Drive the CASSETTE OPENER MECHANISM so it is approximately 10° above horizontal. Measure the projection, dimension X, of the RELEASE ROD from the CARRIER. Note this measurement. It is not important what the actual figure is, it is only a relative measurement.



Now drive the CASSETTE OPENER MECHANISM to its highest position. Measure the projection of the RELEASE ROD from the CARRIER. This measurement should be 2 mm less than the 10° figure obtained above. If the measurement is not 2 mm less, adjust the PUSH ROD, and repeat the steps. Continue until the 2 mm difference is obtained.



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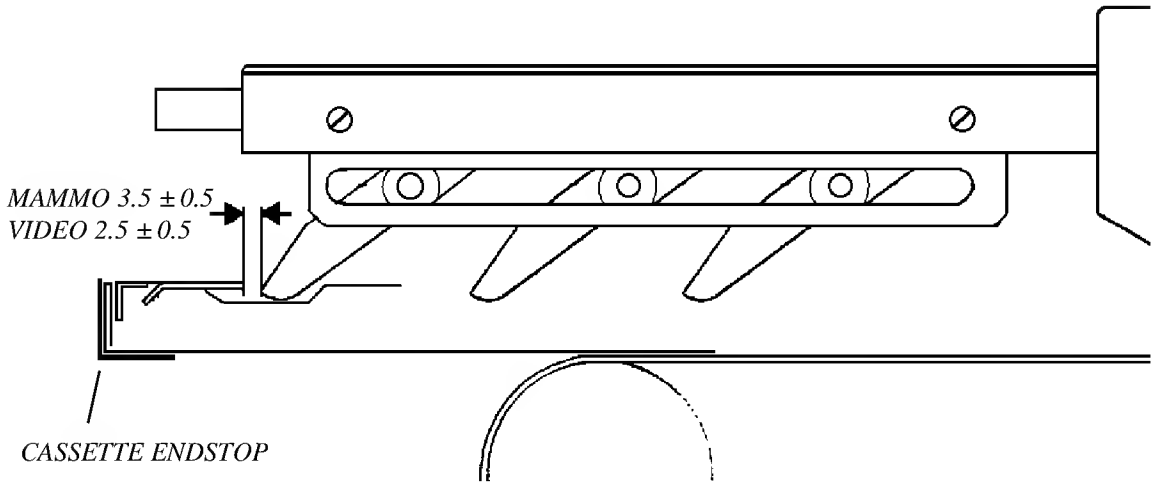
ADJUSTMENT OF THE CASSETTE OPENER SYSTEM CONTINUED.

The final part of the adjustment is to set the OPENING TEETH correctly for each size of CASSETTE. Set the MINILOADER in 24 x 30 mode, enter TEST MODE and drive a 24 x 30 CASSETTE to the ENDSTOP. Drive the CASSETTE OPENER MECHANISM down to its lowest position and to the point just **before** the RELEASE ROD is pushed forward. The gap between the front of the OPENING SHOVEL and the CASSETTE LATCH (see figure) should be 3.5 ± 0.5 mm for MAMMOGRAPHY CASSETTES and 2.5 ± 0.5 mm for VIDEO CASSETTES. If the gap is not correct make a note of the actual gap. Repeat the procedure for 18 x 24 and 8 x 10 inch CASSETTES.

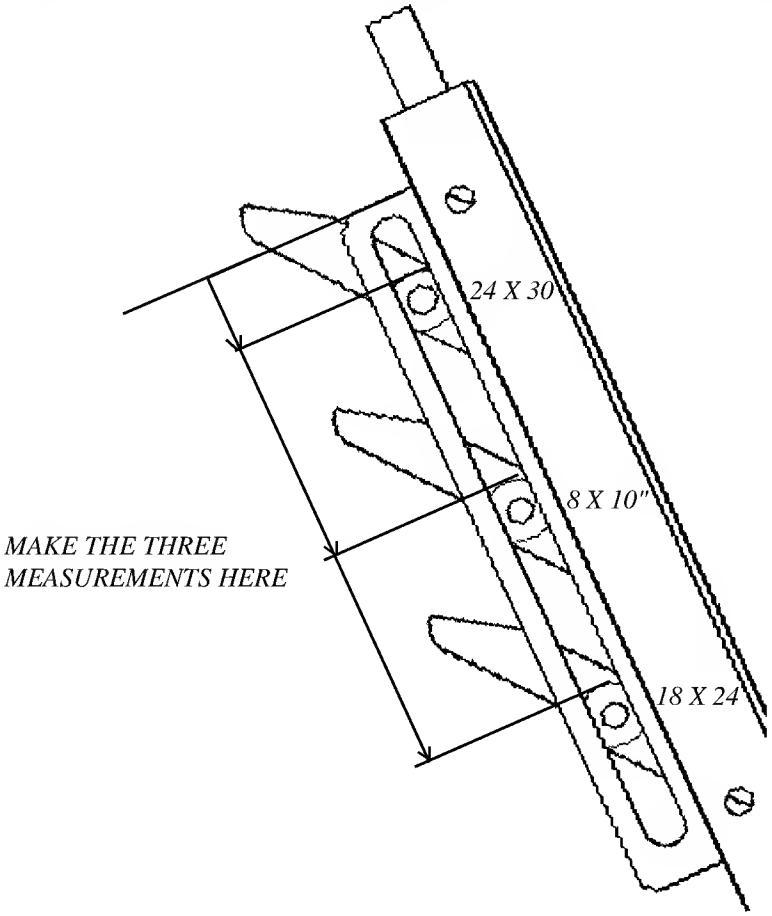


After measuring with all three CASSETTE sizes (if all three are used) you will have a set of figures like the table below. In this example, the 24 x 30 measurement is within tolerance but the 18 x 24 and 8 x 10" gaps require adjustment.

CASSETTE SIZE	DESIRED GAP	MEASURED GAP	DIFFERENCE
18 X 24	3.5±0.5	5.5	+2.0
24 X 30	3.5±0.5	4.0	+0.5
8 X 10"	2.5±0.5	1.0	-1.5

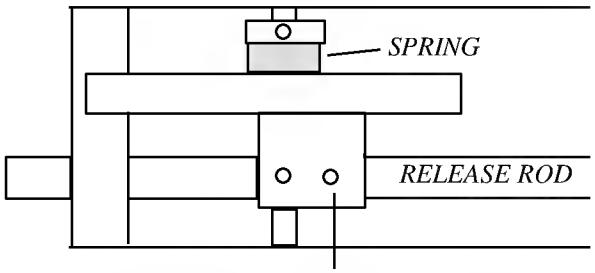
As it is not possible to adjust the gaps while the opener is in the low position, proceed as follows. In TEST MODE, drive the opener to the high position. Using a VERNIER CALLIPER or similar instrument make a measurement from a datum point such as the end of the OPENER MECHANISM to a point on the appropriate OPENING TOOTH for each CASSETTE SIZE. Make a note of the measurements. See the FIGURE opposite. Calculate the new measurement required for the OPENING TOOTH for each size. See the TABLE opposite.

ADJUSTMENT OF THE CASSETTE OPENER SYSTEM CONTINUED.



CASSETTE SIZE	DESIRED GAP	MEASURED GAP	DIFFERANCE	MEASURED DISTANCE	SET DISTANCE TO
18 X 24	3.5±0.5	5.5	+2.0	18	16
24 X 30	3.5±0.5	4.0	+0.5	44	44
8 X 10"	2.5±0.5	1.0	-1.5	72	73.5

Loosen the GRUB SCREW that fastens the OPENER TOOTH to the RELEASE ROD. NOTE - the correct SCREW is the one in the recessed HOLE, the other screw controls the SPRING pressure on the TOOTH. Slide the OPENER TOOTH to its new position and tighten it. Repeat with each size that requires adjustment. Repeat the tests with each size CASSETTE to check the adjustments



LOOSEN THIS SCREW TO SLIDE TOOTH ON RELEASE ROD

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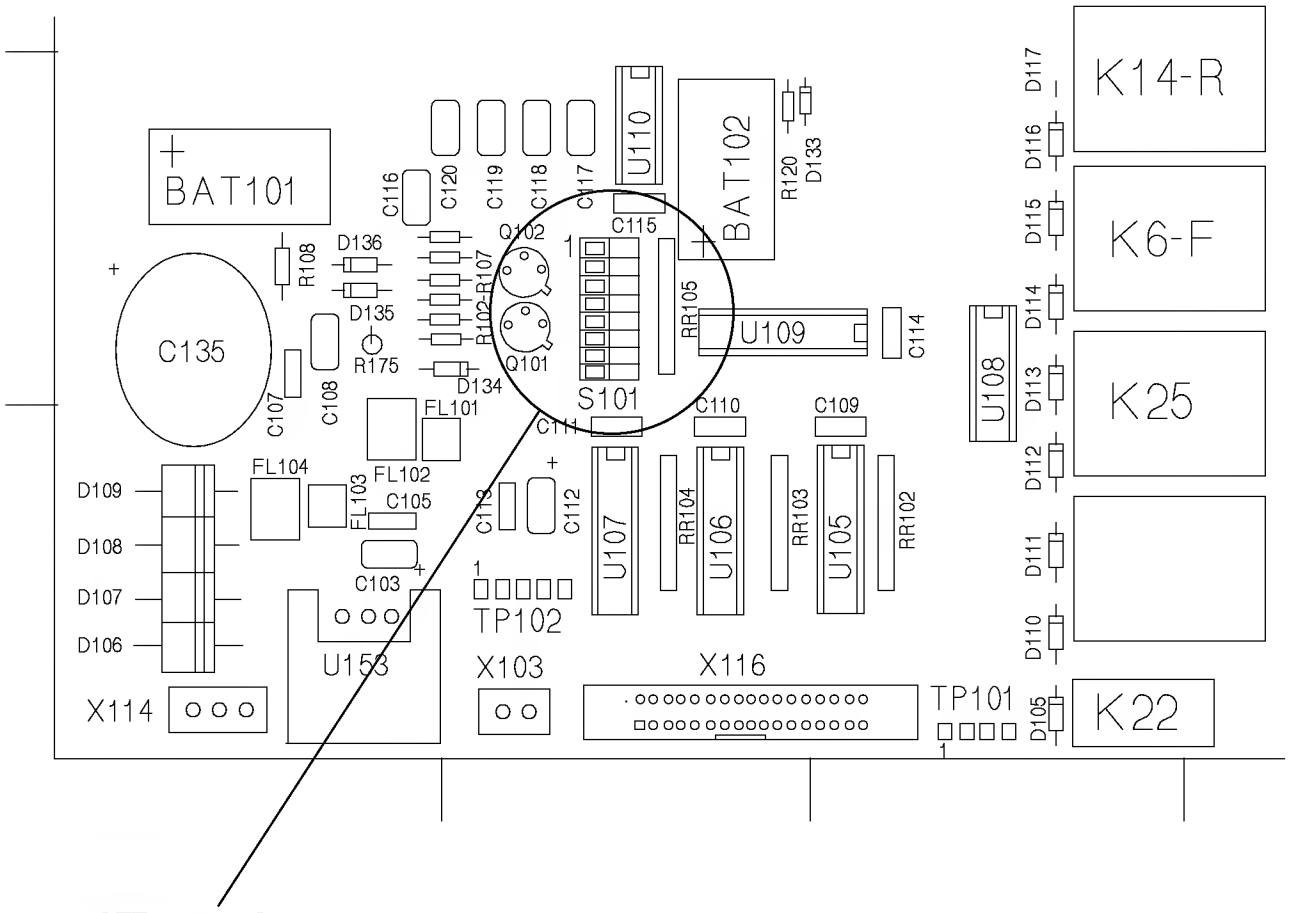
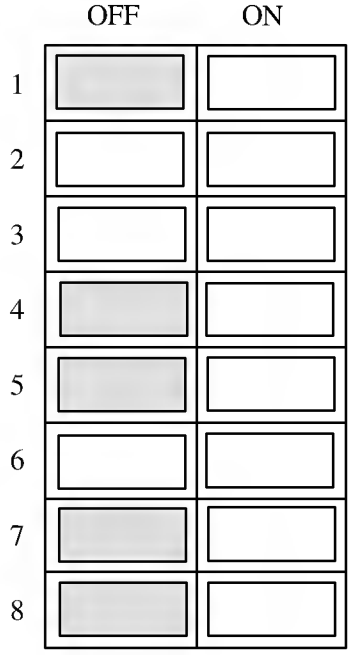
FUNCTION OF DIP-SWITCHES ON PCB 301 (ORIGINAL MACHINE).





1 ON to select CONTINUOUS CYCLES
OFF for customer operation

2 STAND-ALONE only - 2 ON 3 OFF, FILMS collected separately

3 STAND-ALONE only - 3 ON 2 OFF, FILMS collected in one MAGAZINE

4 OFF if the standard CAM MOTOR SPROCKET (10 TEETH) is fitted
ON if the larger "SPEED UP" SPROCKET (14 TEETH) is fitted

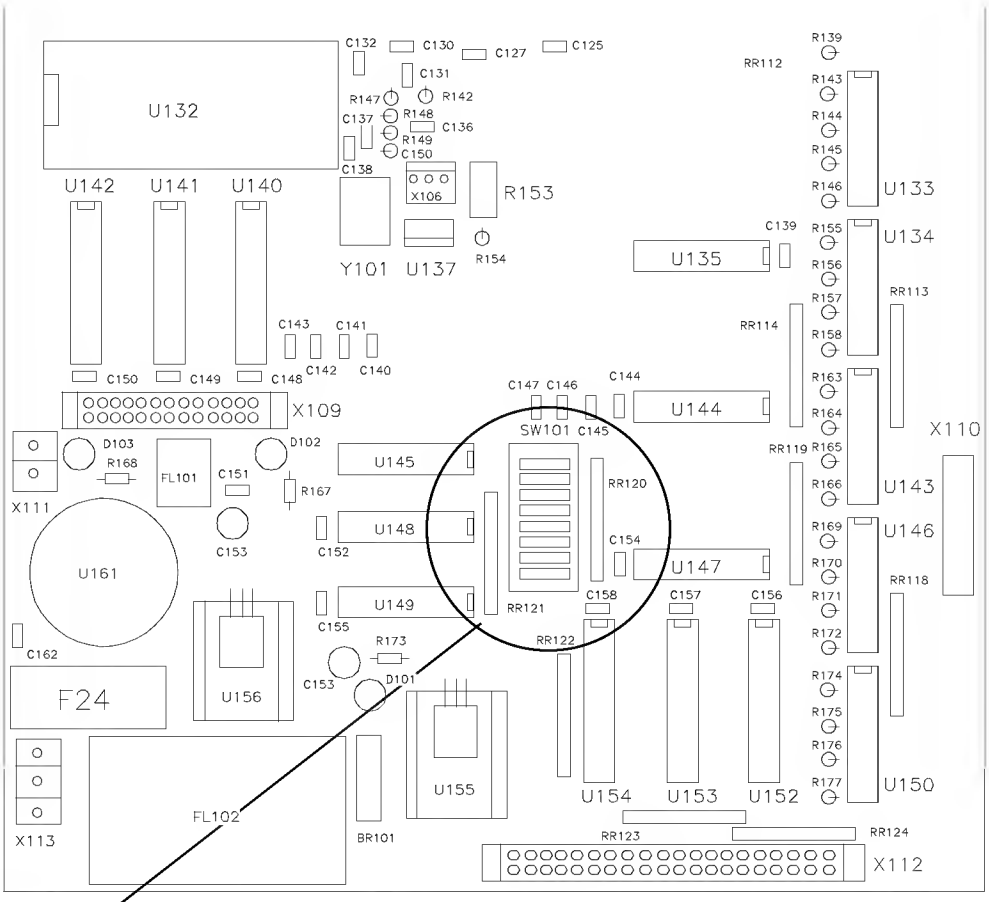
5 OFF to make the CASSETTE INJECTOR operate as the CASSETTE OPENS
ON to prevent the CASSETTE INJECTOR operating unless FC4 detects a FILM

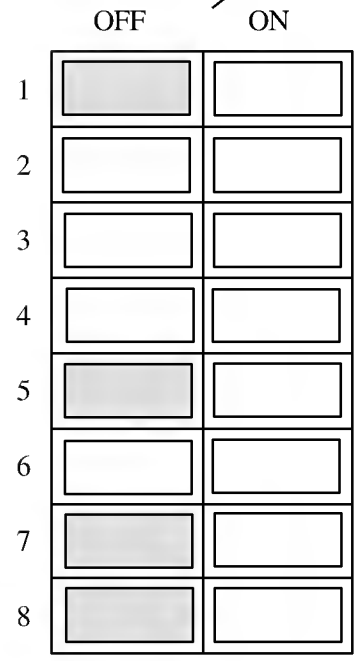
6 ON to make Mod 2 active (second patch on VIDEO CASSETTES)

7 OFF - CASSETTE INJECTOR operates in 8 x 10" mode
ON - CASSETTE INJECTOR does not operate in 8 x 10" mode

8 NO FUNCTION

FUNCTION OF DIP-SWITCHES ON PCB 401 (LOW VOLTAGE).





1 ON to select CONTINUOUS CYCLES
OFF for customer operation

2 STAND-ALONE only - 2 ON 3 OFF, FILMS collected separately

3 STAND-ALONE only - 3 ON 2 OFF, FILMS collected in one MAGAZINE

4 NO FUNCTION

5 OFF to make the CASSETTE INJECTOR operate as the CASSETTE OPENS
ON to prevent the CASSETTE INJECTOR operating unless FC4 detects a FILM

6 ON to make second patch detection on VIDEO CASSETTES active

7 OFF - CASSETTE INJECTOR operates in 8 x 10" mode
ON - CASSETTE INJECTOR does not operate in 8 x 10" mode

8 NO FUNCTION

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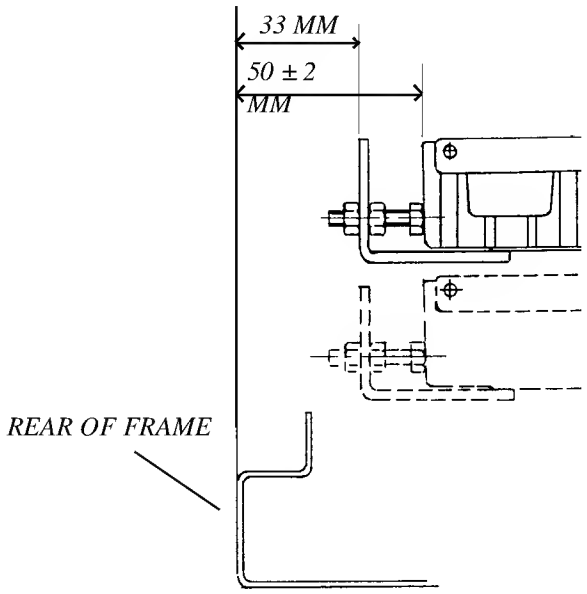
ADJUSTMENT OF THE MAGAZINE CARRIAGE MICROSWITCHES.

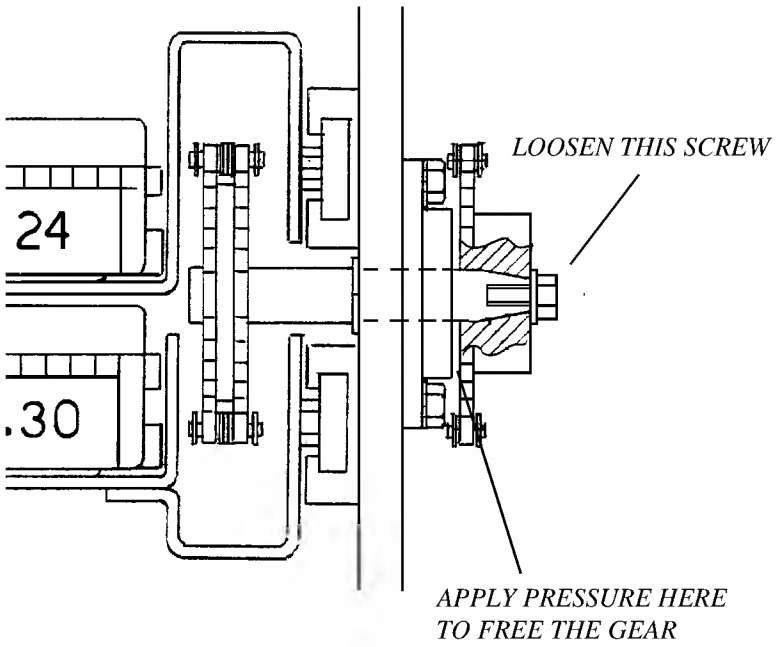
Procedure for adjusting MICROSWITCHES MS8 & MS9. NOTE - These SWITCHES are not fitted to the LOW VOLTAGE machines. For LOW VOLTAGE machines see "SETTING MAGAZINE ENCODER".

MICROSWITCH MS8 is used to detect the MAGAZINE carriage is at it's limit position. I.e. either the UPPER CARRIAGE is at the rear, or the LOWER CARRIAGE is at the rear. MS9 is required to detect which condition actually exists.

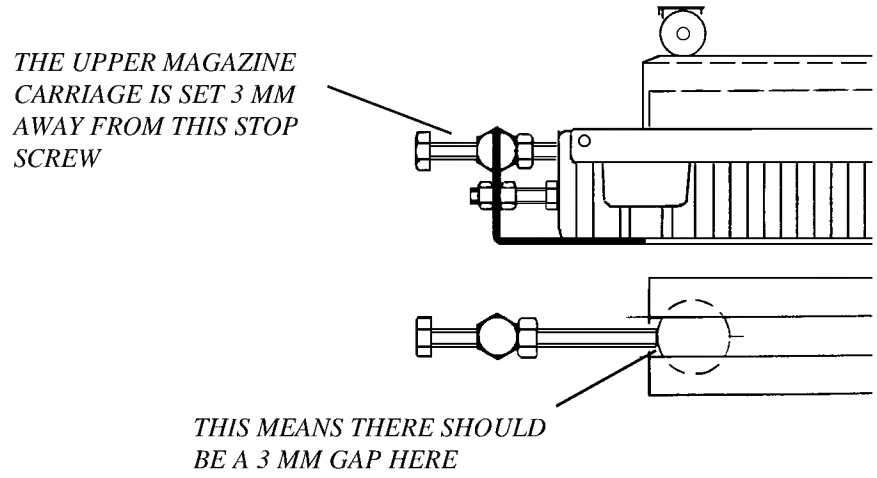
The mechanical positions of the MAGAZINE CARRIER STOPS and the MAGAZINE POSITION STOPS are factory set, and should not need adjustment. However, the settings of the STOPS can be checked by using the drawing shown opposite. The measurements are made with reference to the REAR PLANE of the MINILOADER. If any alteration is made to either of these settings, the MAGAZINE INJECTOR BAR setup procedure will need to be repeated, and the delivery of the FILM into the CASSETTE will also be affected.



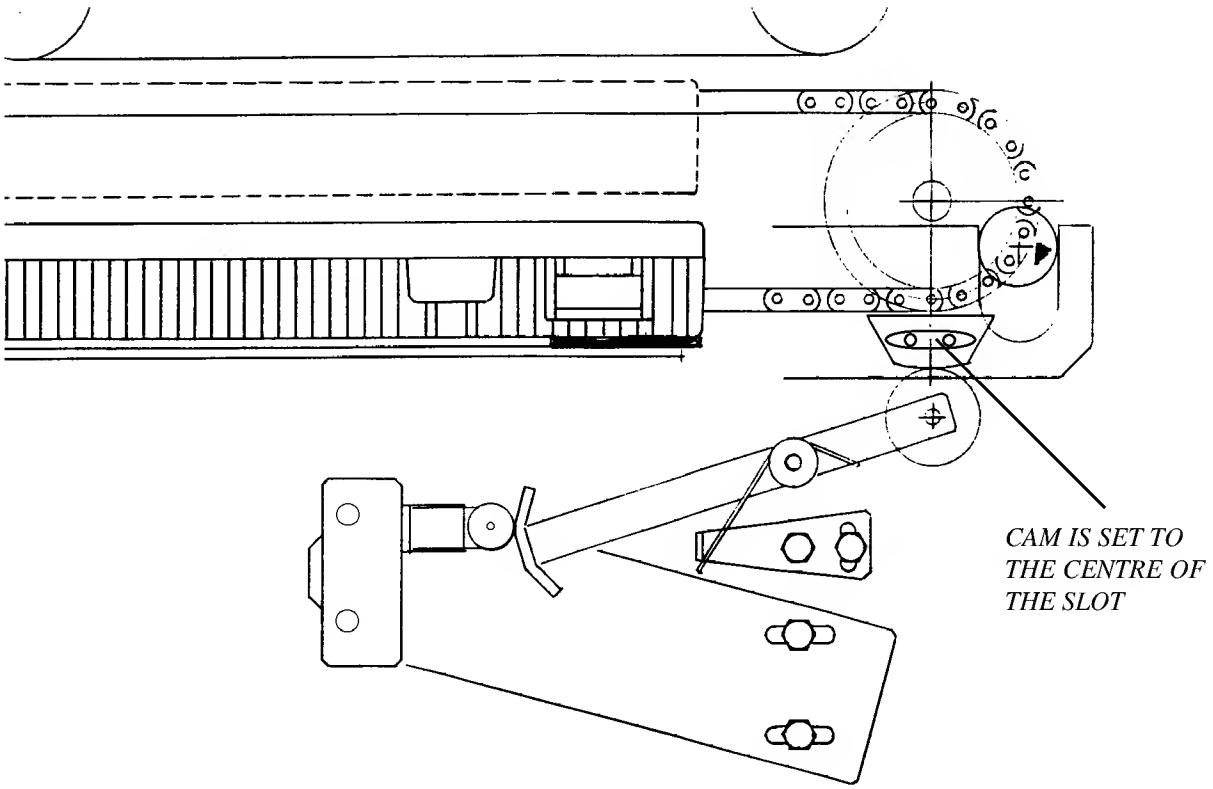
To make it easier to move the MAGAZINE CARRIAGES in and out, disengage the CARRIAGE DRIVE GEAR by loosening the SCREW as shown. It will be necessary to apply some pressure behind the GEAR with a SCREWDRIVER as shown to release the GEAR from the TAPERED SHAFT. Now the MAGAZINE CARRIAGE will move freely backwards and forwards



The UPPER MAGAZINE CARRIAGE is now pushed to the rear position and set so there is a 3 mm gap between the CARRIAGE and the STOP SCREW. Lock the CARRIAGE in position by re-tightening the SCREW on the DRIVE GEAR.

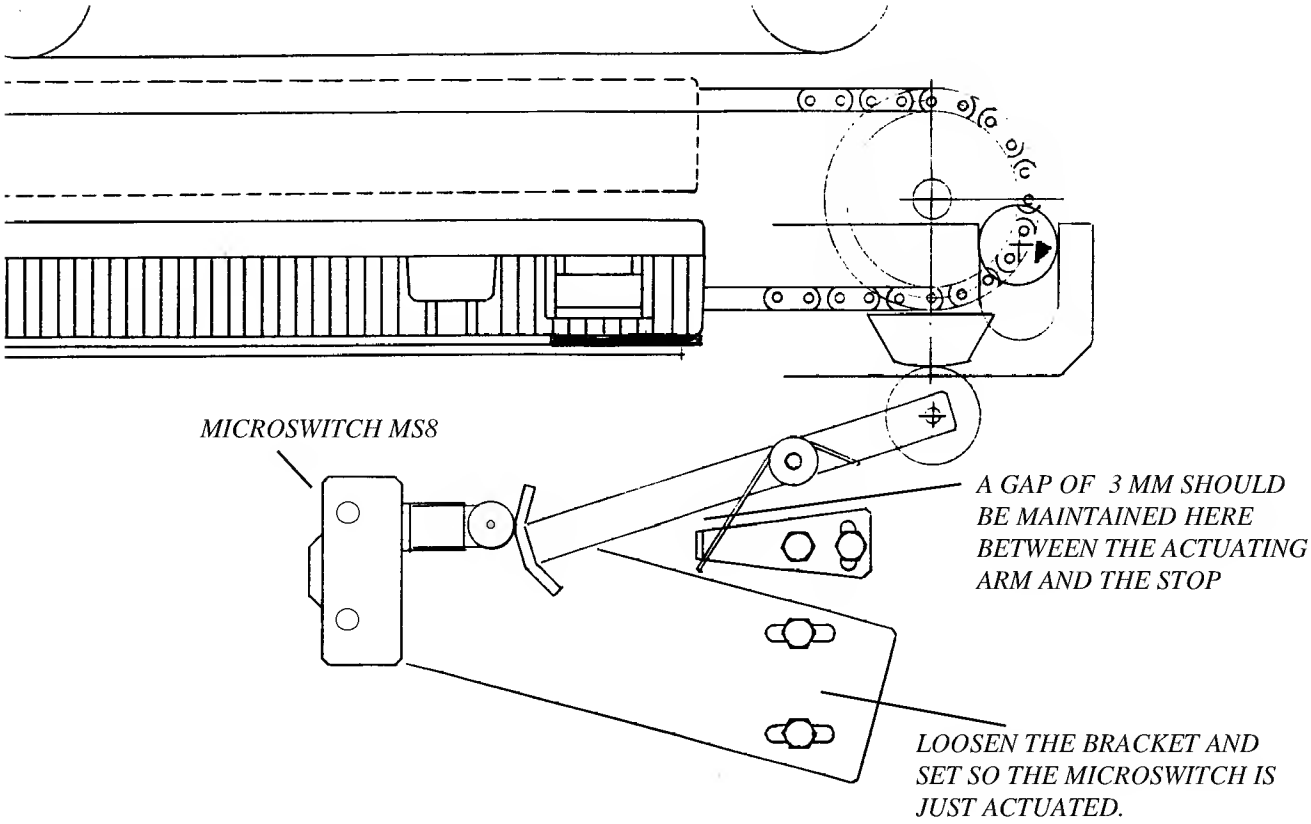


The CAM on the CHAIN is now set so it is in the centre of the SLOT. NOTE - Earlier MINILOADERS had fixed CAMS, the later CAMS are adjustable. If the correct adjustment cannot be achieved, order new CAMS (part number 30023111), all CAMS in stock are the new type.



 © Kodak Ltd.

Now loosen the securing BRACKET for MICROSWITCH MS8 and set the MICROSWITCH so it is just actuated. Check that there is a gap of 3 mm between the MICROSWITCH ACTUATING ARM and the STOP, if necessary, adjust the STOP.


MICROSWITCH MS8
A GAP OF 3 MM SHOULD BE MAINTAINED HERE BETWEEN THE ACTUATING ARM AND THE STOP
LOOSEN THE BRACKET AND SET SO THE MICROSWITCH IS JUST ACTUATED.

Now free the DRIVE GEAR again, move the CARRIAGE my hand, and check that the MICROSWITCH MS8 is actuated as you push the UPPER CARRIAGE to the rear. The MICROSWITCH must actuate before the CARRIAGE reaches the STOP SCREW. Ensure the MICROSWITCH MOUNTING BRACKET SCREWS are tightened correctly.

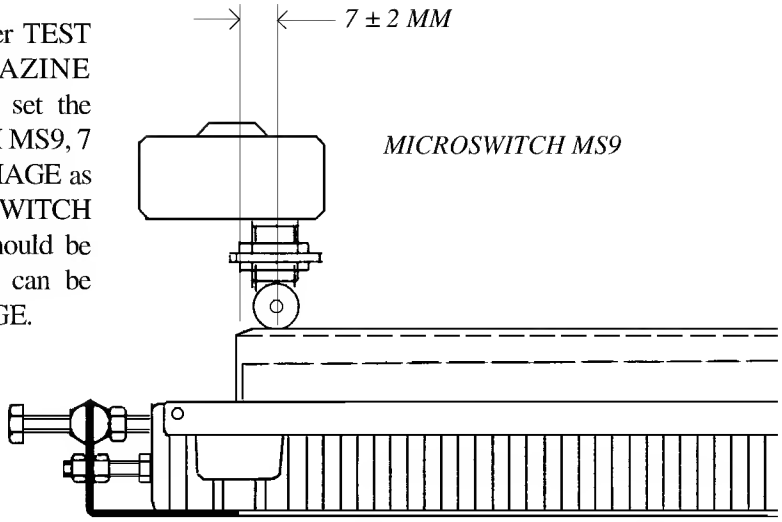
Push the MAGAZINE CARRIAGE by hand so the REAR MAGAZINE is in the rear position, and set it 3 mm before the STOP SCREW. Lock the CARRIAGE in position by tightening the DRIVE GEAR SCREW.

The MICROSWITCH MS8 cannot be moved again or the previous adjustment would be lost, so the position of the CAM on the CHAIN must be altered so the MICROSWITCH is just actuated. Again, free the CARRIAGE, move it by hand and check that the MICROSWITCH is actuated before the STOP SCREW is reached.

If necessary, order a new adjustable CAM to replace the existing fixed one - see the note on the previous page.

MICROSWITCH MS9 is used to detect that the UPPER MAGAZINE CARRIAGE is in the rear position.

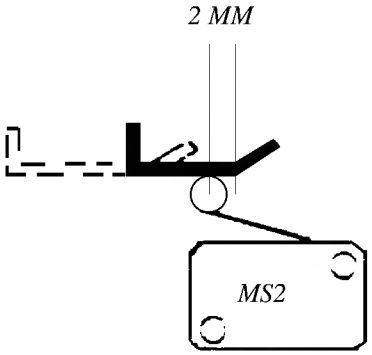
To adjust MICROSWITCH MS9, enter TEST MODE, drive the UPPER MAGAZINE CARRIAGE to the rear position, and set the CENTRE LINE of the MICROSWITCH MS9, 7 ± 2 mm back from the end of the CARRIAGE as shown below. Make sure the MICROSWITCH height is set correctly, the SWITCH should be actuated by about 2 mm, otherwise it can be damaged by the MAGAZINE CARRIAGE.



ADJUSTMENT OF MICROSWITCHES MS1 and MS2.

MICROSWITCHES MS1 and MS2 are used to detect if a CORRECT MAGAZINE is present in the CARRIAGE. There are SLOTS in the rear of all MAGAZINES. The SLOT is in a different position for UPPER and LOWER CARRIAGE MAGAZINES.

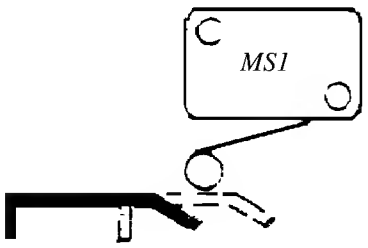
Only when the correct MAGAZINE is fitted will the SWITCH be operated. The MINILOADER cannot detect the difference between no MAGAZINE being present and the correct MAGAZINE being fitted. Therefore the error message is always "MAGAZINE NOT IN CORRECT POSITION"



To set MICROSWITCHES MS1 and MS2, place a MAGAZINE in the CARRIAGE, enter TEST MODE and drive the CARRIAGE to the rear STOP POSITION. Loosen the MICROSWITCH and set it so that it actuates at a point 2 mm back from the edge of the RAMP as shown in the drawing.

Ensure that the MICROSWITCH does not "bottom" or it may be damaged.

Repeat the procedure with a MAGAZINE in the other CARRIAGE.



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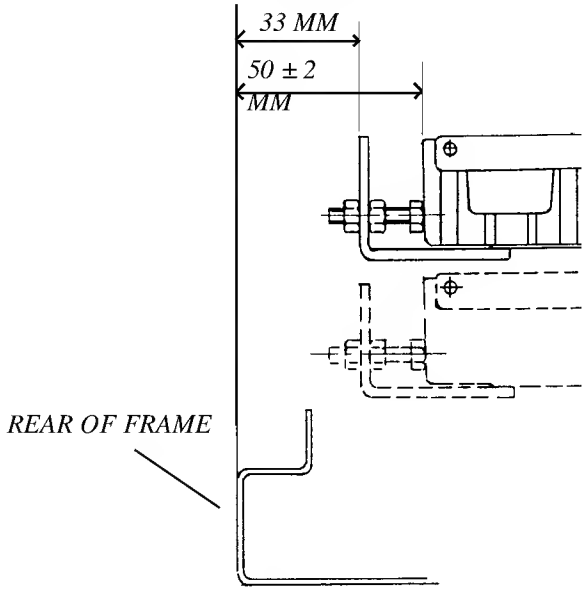
ADJUSTMENT OF THE MAGAZINE ENCODER (LOW VOLTAGE ONLY)

The MAGAZINE ENCODER is used to detect the position of the MAGAZINE CARRIAGE.

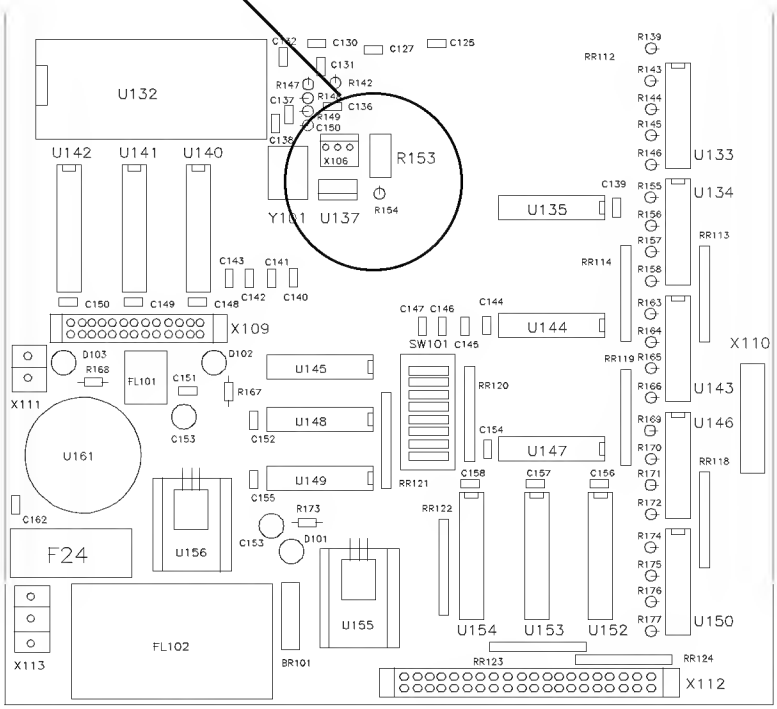
The mechanical positions of the MAGAZINE CARRIER STOPS and the MAGAZINE POSITION STOPS are factory set, and should not need adjustment. However, the settings of the STOPS can be checked by using the drawing shown opposite. The measurements are made with reference to the REAR PLANE of the MINILOADER. If any alteration is made to either of these settings, the MAGAZINE INJECTOR BAR setup procedure will need to be repeated, and the delivery of the FILM into the CASSETTE will also be affected.



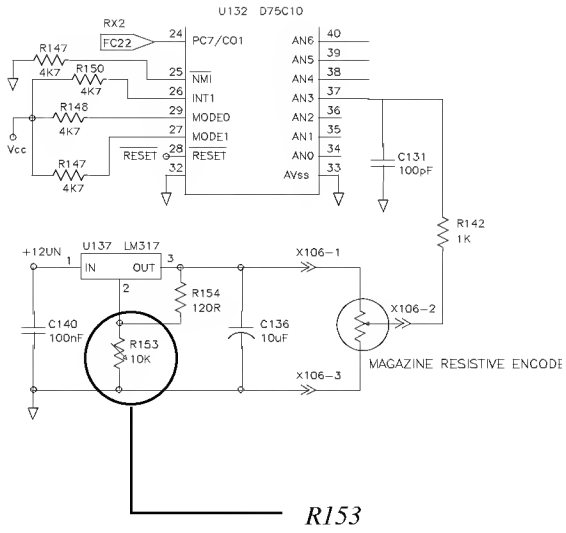
The voltage between PINS 1 and 3 of SOCKET X106 should be set to 5.2 volts. This sets the correct calibration for the MAGAZINE RESISTIVE ENCODER.

The CIRCUIT DIAGRAM is shown on the next page.

PCB 401



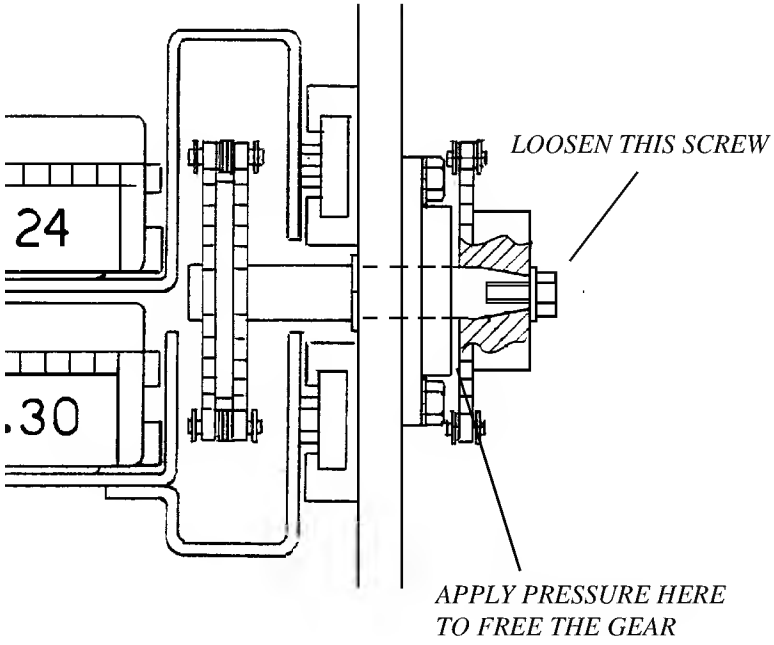
CIRCUIT OF RESISTIVE ENCODER



Enter TEST MODE (SWITCH SW302 on PCB 403 up). Press SWITCH S18 on the KEYPAD until the MESSAGE, "MOTORS AND SOLENOIDS VALVE TEST" is displayed. Press S19 on the KEYPAD the MESSAGE , "MAGAZINE ENCODER POSITION XXX" should be displayed.

The next stage is to place the MAGAZINE CARRIAGE in ZERO POSITION.

To make it easier to move the MAGAZINE CARRIAGES in and out, disengage the CARRIAGE DRIVE GEAR by loosening the SCREW as shown. It will be necessary to apply some pressure behind the GEAR with a SCREWDRIVER as shown to release the GEAR from the TAPERED SHAFT. Now the MAGAZINE CARRIAGE will move freely backwards and forwards



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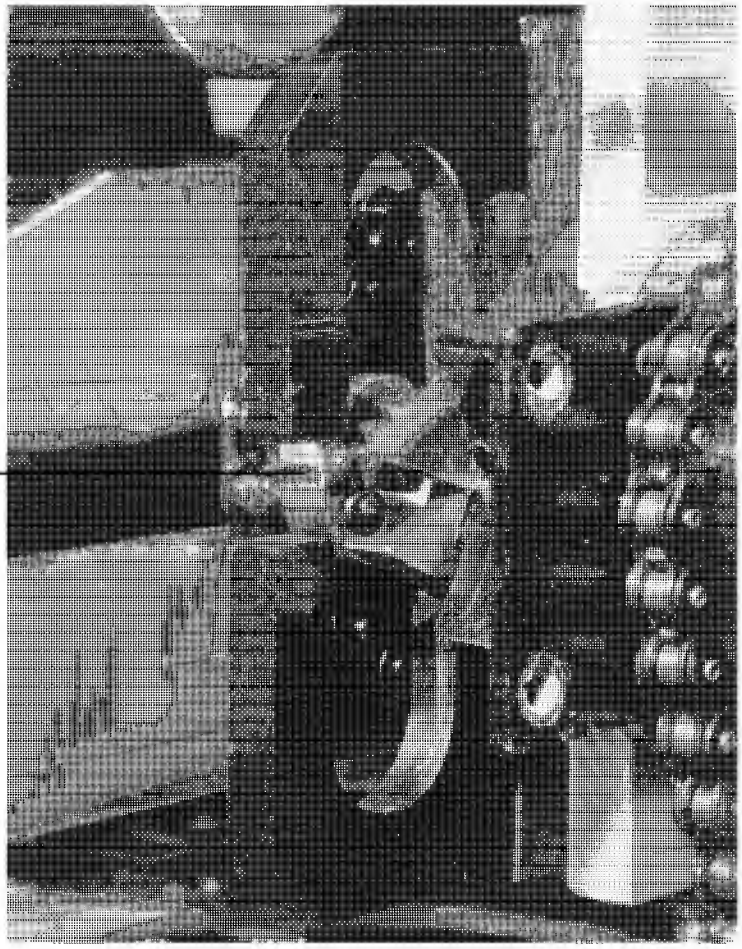
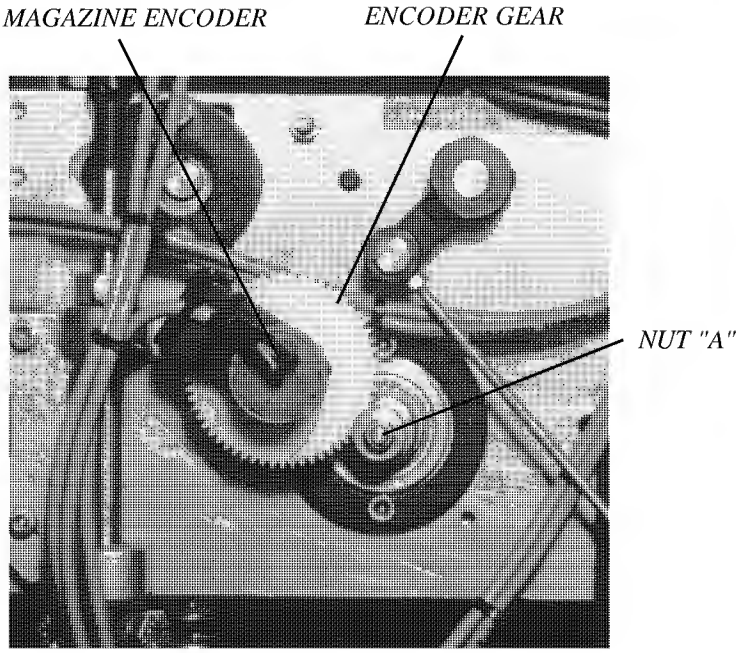
Pull the MAGAZINE CARRIAGES by hand until the MAGAZINE DRIVER is in the centre position with both MAGAZINES at the front of the MINILOADER as shown opposite.



Re-tighten the SCREW on the DRIVE GEAR.

Loosen the NUT "A" on the MAGAZINE ENCODER DRIVE ASSEMBLY, and rotate the MAGAZINE ENCODER GEAR until the DISPLAY shows, "MAGAZINE ENCODER POSITION 125". The reading will vary, but the average value seen should be 125. Carefully tighten NUT "A", and check the average reading is still 125. If necessary, repeat the procedure.

Leave the TEST MODE.

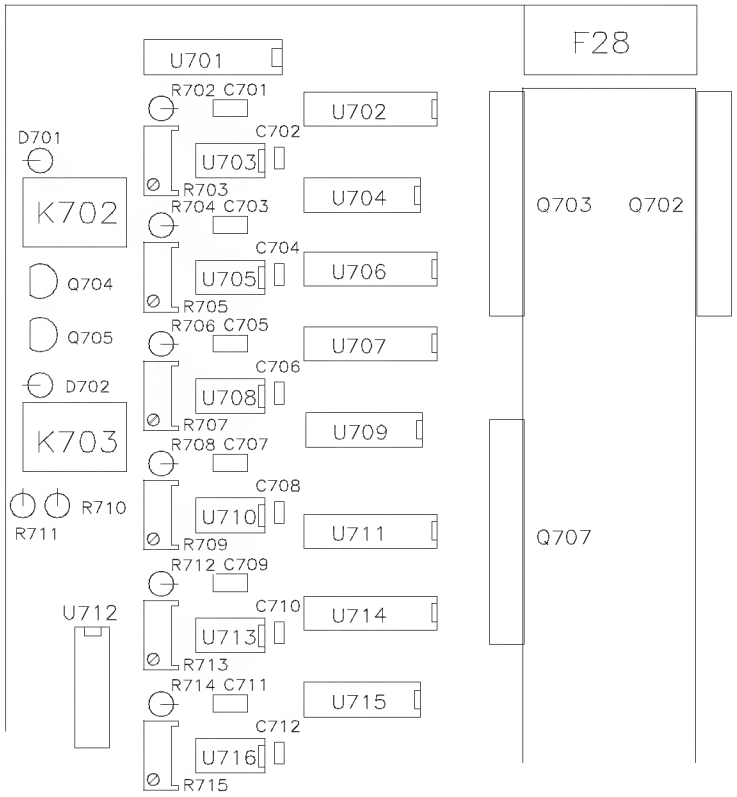


The MAGAZINE CARRIAGE is driven at two speeds. The FAST SPEED is used until the CARRIAGE is near its destination, then the SLOW SPEED is selected to ensure accurate positioning of the CARRIAGE.

On PCB 207 check that R709 (MAGAZINE CARRIAGE FAST SPEED) is set to maximum - fully clockwise. Change FORMATS to check each time the CARRIAGES UPPER and LOWER are driven fully to the ENDSTOPS. A definite mechanical location of the CARRIAGES should be heard.

If the CARRIAGE hits the ENDSTOP too hard decrease the SLOW SPEED of the MAGAZINE CARRIAGE MOTOR - POTENTIOMETER R707 on PCB 207. Turn the POTENTIOMETER one turn counter clockwise and check again.

If the CARRIAGES are not driven firmly against the ENDSTOPS, increase the SLOW SPEED of the MAGAZINE CARRIAGE MOTOR - POTENTIOMETER R707 on PCB 207. Turn the POTENTIOMETER one turn clockwise and check again.



PCB 207

Finally, load both a UPPER and LOWER MAGAZINE with a few TEST FILMS so they will be detected as, "NEARLY EMPTY". Enter a 18 x 24 CASSETTE and carry out a cycle. At the end of the cycle, the MAGAZINE will be sent to the, "RELOAD POSITION". Enter the CASSETTE again and check that the MAGAZINE CARRIAGE again reaches the ENDSTOP firmly. If not again increase the SLOW SPEED by one turn and repeat the test.

Do the same check with the LOWER MAGAZINE size CASSETTE.

This final test is necessary because when a CASSETTE is entered with a MAGAZINE in the RELOAD POSITION the BELT MOTOR runs continually until the MAGAZINE has reached the rear position and the size of the MAGAZINE has been checked with the MICROSWITCHES MS1 or MS2 (depending on UPPER or LOWER CARRIAGE). This means that slightly less voltage is available for the MOTORS so the CARRIAGE MOTOR runs a little slower. If the CARRIAGE does not reach the ENDSTOP in this case, the ERROR MESSAGE, "MAGAZINE NOT IN CORRECT POSITION" will occur

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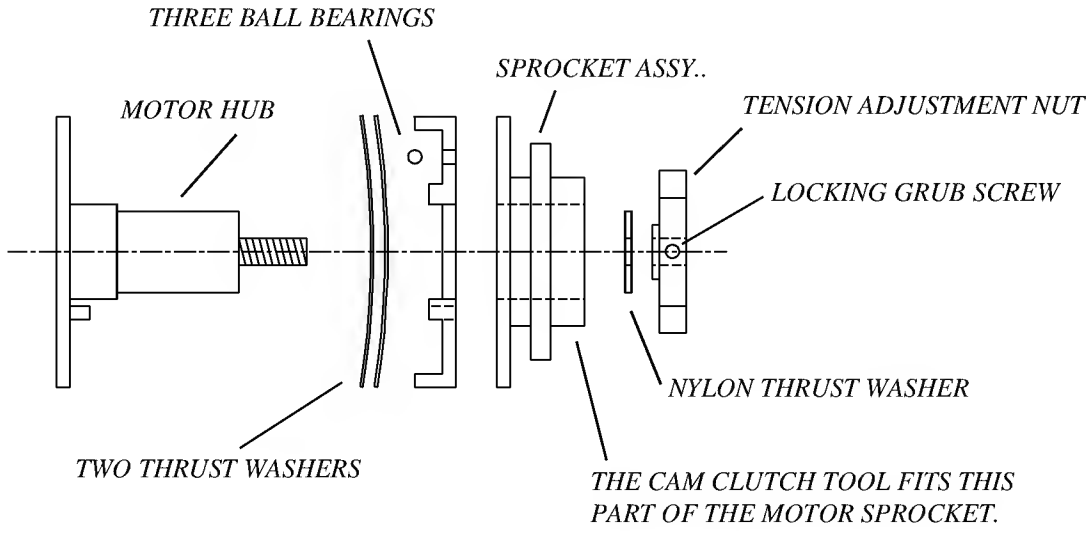
CAM MOTOR CLUTCH TENSION.

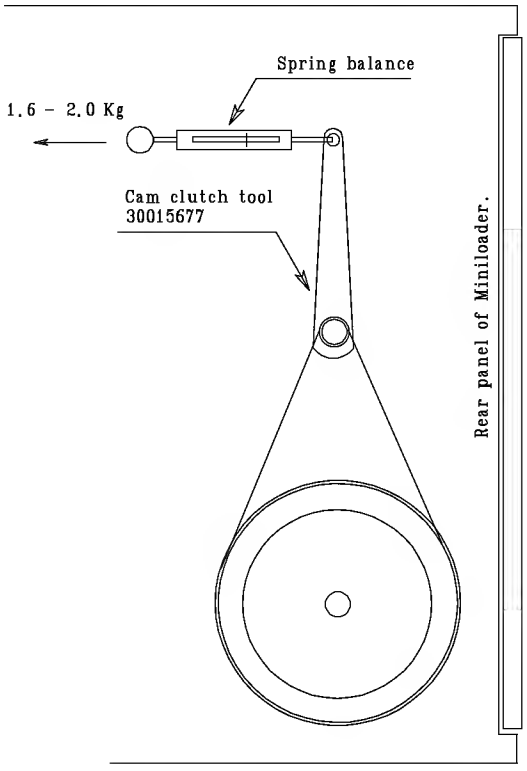
ON THE LV MINILOADER THE CAM MOTOR CLUTCH IS TIGHTENED UNTIL THE CLUTCH IS LOCKED AS THE MOTOR CURRENT IS ELECTRONICALY LIMITED.

An exploded view of the CAM MOTOR CLUTCH is shown below. The tension is adjusted by tightening or loosening the NUT. This controls the point at which the BALL BEARINGS will slip out of their LOCATING CUPS and allow the CLUTCH to slip.

It is important that the locking GRUB SCREW is slackened before attempting to adjust the CLUTCH, and that the locking SCREW is tightened again afterwards.



Switch the MINILOADER power off. With the CAM SYSTEM in HOME POSITION, and no customer FILMS in the MAGAZINES, fit TOOL M224 (PART NUMBER 30015677) to the NUT on the CAM MOTOR SPROCKET. Using a SPRING BALANCE test the tension of the CAM MOTOR CLUTCH. The CLUTCH should slip when a pull of 1.5 to 2.0 Kg is applied (2.0 to 2.5 Kg for a STAND ALONE machine).



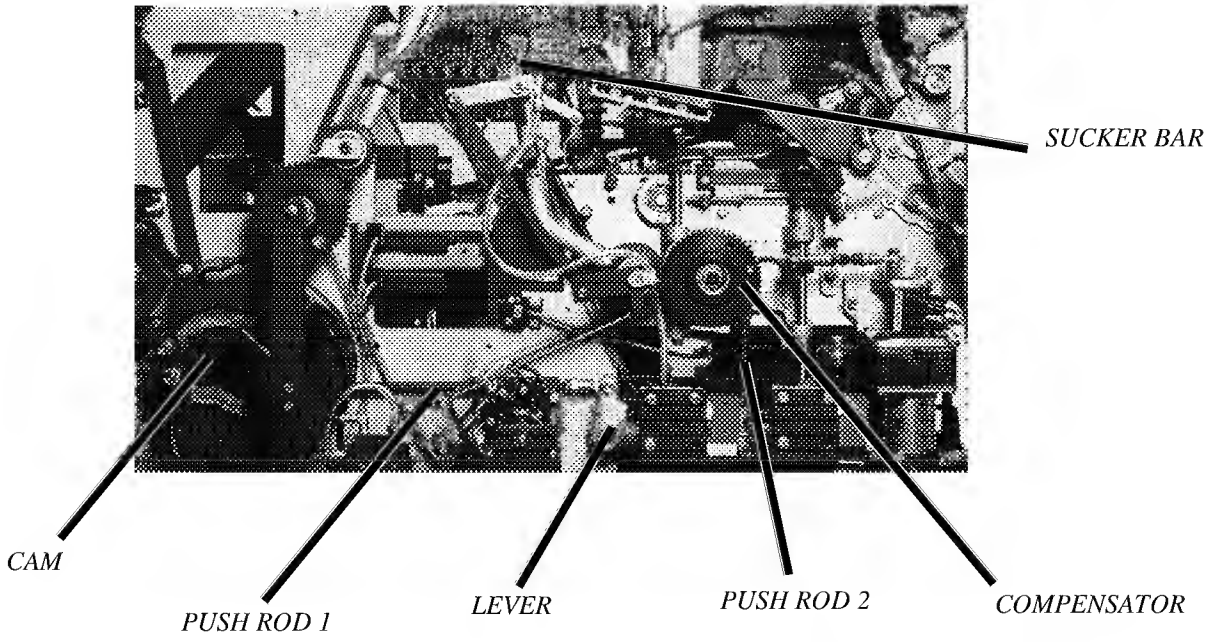
If the tension in not correct, loosen the GRUB SCREW, and either tighten the ADJUSTING NUT to increase the point at which the CLUTCH slips, or vice versa.

CHAIN TENSION.

The CAM MOTOR CHAIN tension is correct when there is a free play of 4 mm at the centre.

ADJUSTMENT OF MAGAZINE SUCKER BAR.

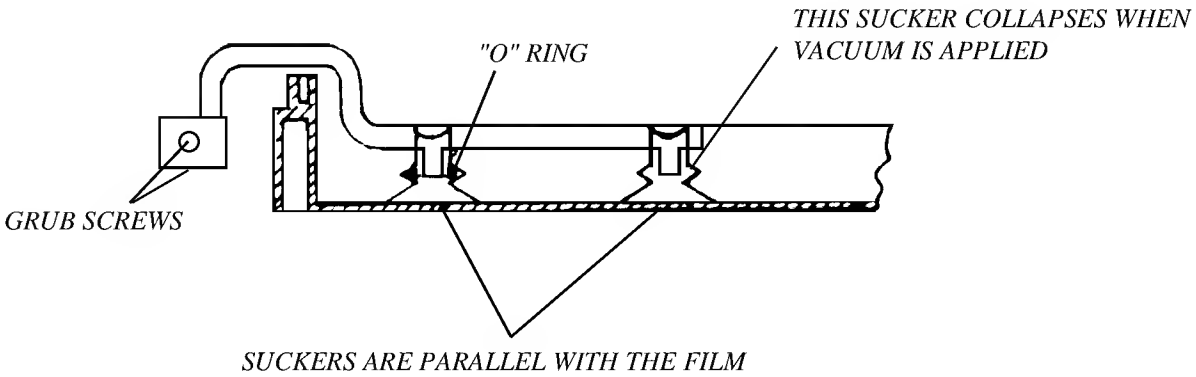
The MAGAZINE SUCKER BAR is driven by a CAM and two PUSH RODS via a LEVER through GEARS and a COMPENSATOR ASSEMBLY which allows for the varying height of the FILM STACK in the MAGAZINE and the different height of the UPPER and LOWER MAGAZINES.



Before starting any adjustment of the SUCKER BAR, check that the SUCKER nearest the PIVOT id fitted with an "O" RING as shown below. This "O" RING prevents this SUCKER collapsing when the VACUUM is applied thus allowing the other SUCKER to collapse and "peel" the top FILM off the FILM STACK.

To adjust the MAGAZINE SUCKER BAR place one film in the 18 x 24 SUPPLY MAGAZINE. Enter TEST MODE and drive the MAGAZINE to the back of the MINILOADER. Drive the CAM MOTOR forwards until the SUCKERS are about 2 mm above the FILM in the MAGAZINE. Note that the TILT MOTOR must be in the HOME position. If necessary, loosen the GRUB SCREWS (see below) and alter the angle of the SUCKER BAR so that the SUCKERS are parallel with the FILM.

Both SUCKERS should be the same distance from the FILM. If they are not adjust the height of the SUCKERS individually. On later MINILOADERS the SUCKERS can be moved individually by loosening the SCREWS "A" (see figure opposite), on earlier machines it is necessary to carefully reform the SUCKER BAR. If desired the new style SUCKER BAR can be fitted. The PART NUMBER is 30026387 and the new BAR is a direct replacement.



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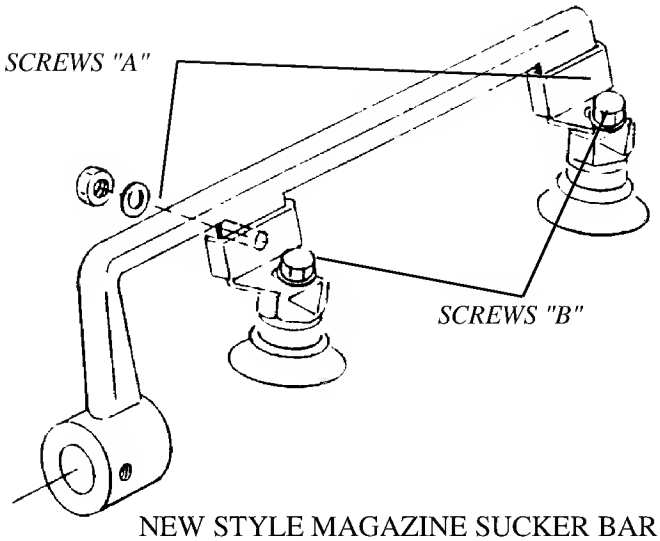
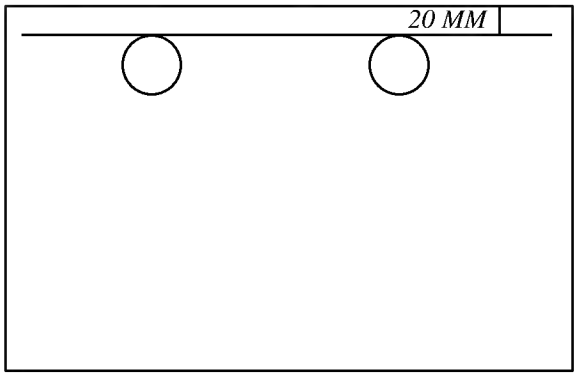
On the new style SUCKER BAR shown adjacent, the SCREWS "A" adjust the height of the SUCKERS, the SCREWS "B" allow lateral movement of the SUCKERS.



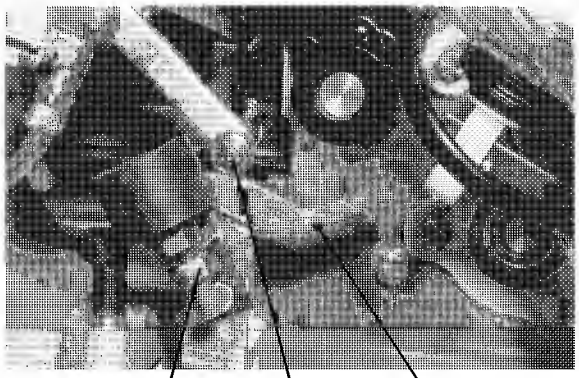
NEW STYLE MAGAZINE SUCKER BAR

The leading edge of the SUCKERS should be 20 mm from the edge of the MAGAZINE FILM. With the new style BAR, this is achieved by means of SCREWS "B", with the old BAR this setting is obtained by carefully reforming the BAR. See note on previous page about fitting the new SUCKER BAR.



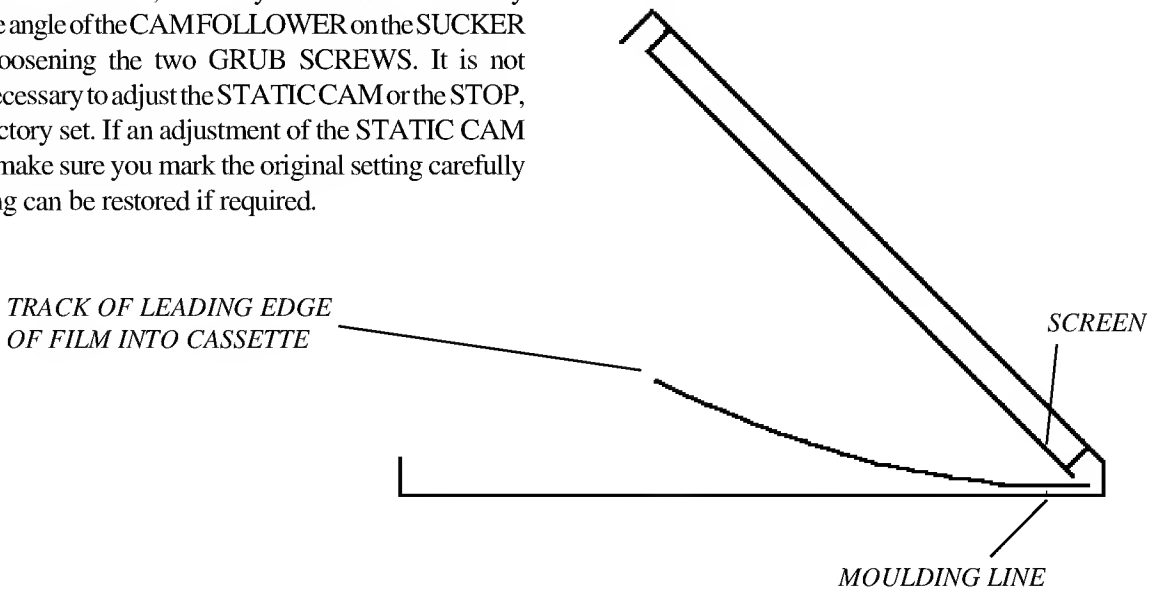
Once the SUCKERS are correctly set in the MAGAZINE, the setting at the CASSETTE end of the travel can be carried out. See the further instructions on the next page.

This FIGURE shows the MAGAZINE SUCKER BAR approaching the CASSETTE. The CAM FOLLOWER is starting to run on the STATIC CAM. The profile of the CAM and the angle of the CAM FOLLOWER on the SUCKER BAR, control the angle at which the FILM and SUCKERS enter the CASSETTE.



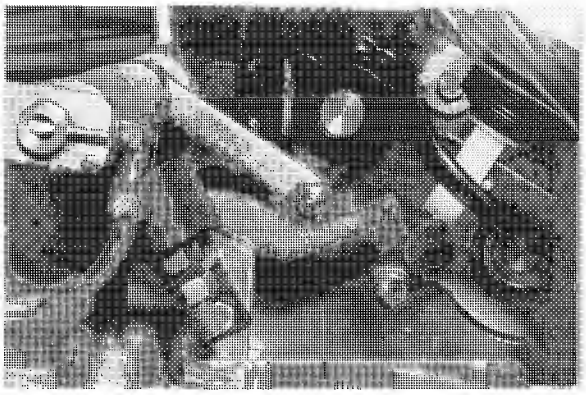
The aim is to "tuck" the FILM between the SCREEN and BASE of the CASSETTE. The leading edge of the FILM should follow the "track" shown below. It should miss the bottom edge of the CASSETTE SCREEN, and go just above the MOULDING LINE in the BASE of the CASSETTE.

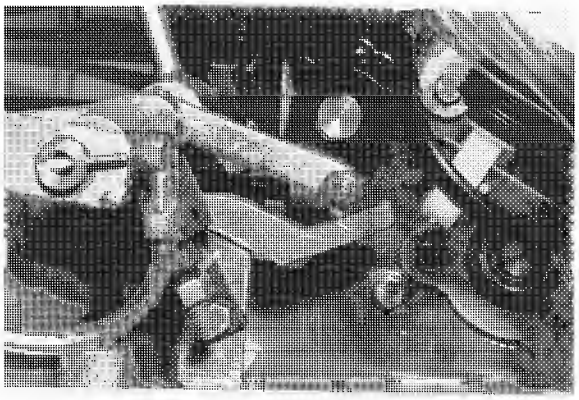
If the "track" is incorrect, normally if can be corrected by adjusting the angle of the CAM FOLLOWER on the SUCKER BAR. by loosening the two GRUB SCREWS. It is not normally necessary to adjust the STATIC CAM or the STOP, these are factory set. If an adjustment of the STATIC CAM is required make sure you mark the original setting carefully so the setting can be restored if required.



The two pictures below show the SUCKER BAR approaching and reaching the drop position.

At the point of FILM release the SUCKERS should be parallel to the CASSETTE BASE and there should be a minimum clearance of 2 mm between the bottom of the SUCKERS and the FILM after the FILM is dropped.





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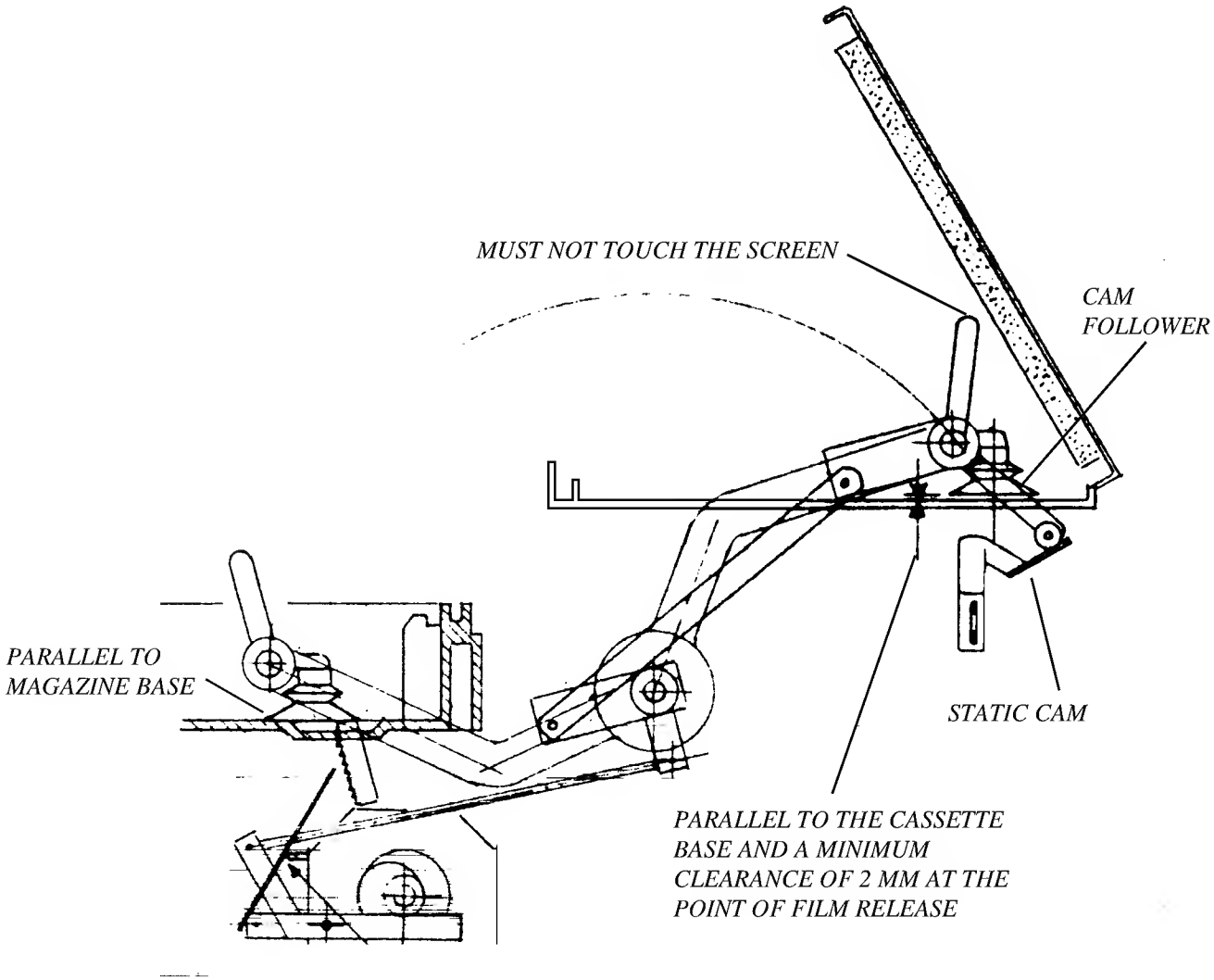
It is important that the SUCKER BAR does not touch the CASSETTE SCREEN, or SCREEN damage will result. See the FIGURE below.

If the SUCKER BAR will not go far enough into the CASSETTE to release the FILM in the correct place, it may be necessary to adjust the PUSH RODS and/or the STOP.

The SUCKER BAR should press against the STOP with a force of about 0.5 Kg. If the force is greater than this mechanical wear will occur and CAM SYSTEM MALFUNCTIONS may result.

Note that the CAM MOTOR does not stop for FILM release, there is a dwell on the SUCKER BAR CAM that holds the SUCKER BAR stationary while the VACUUM is released.

Always check at the end of the adjustments that all the points on the drawing below are correct.

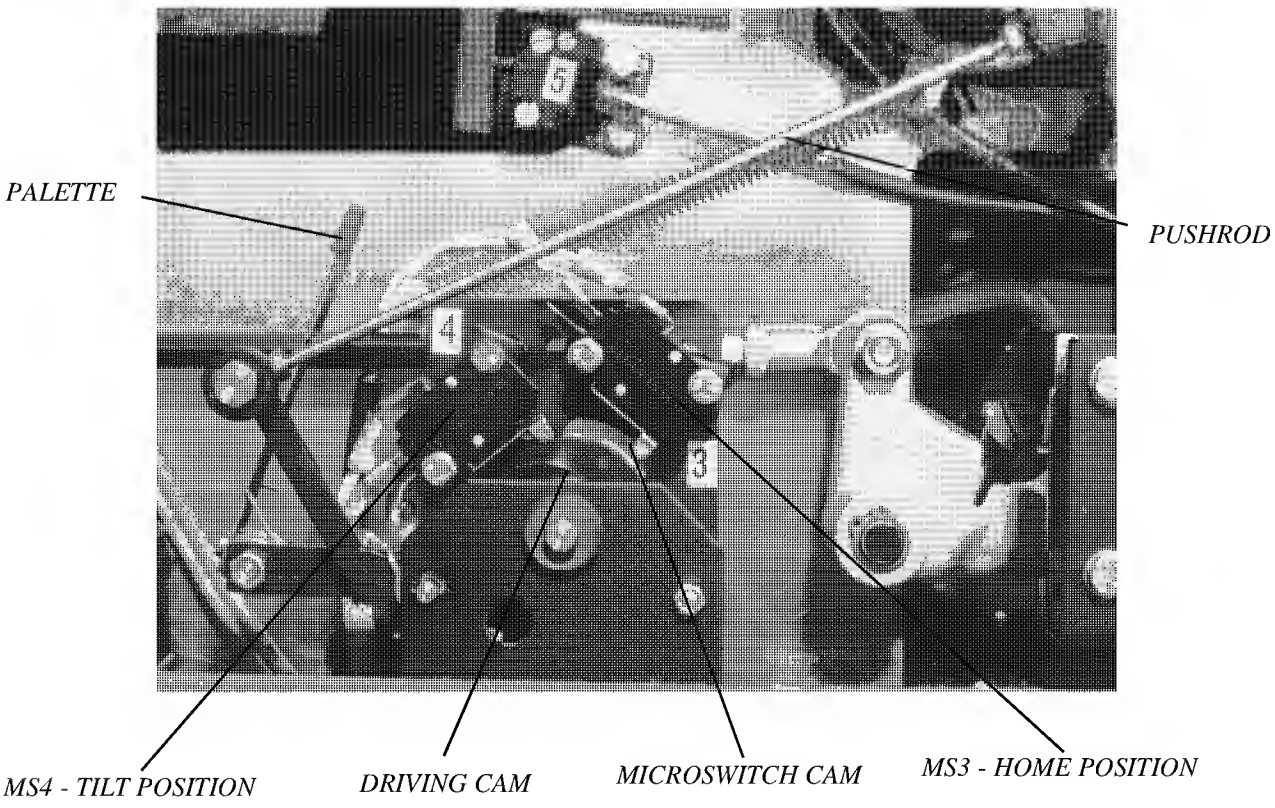

MUST NOT TOUCH THE SCREEN
CAM FOLLOWER
PARALLEL TO MAGAZINE BASE
STATIC CAM
PARALLEL TO THE CASSETTE BASE AND A MINIMUM CLEARANCE OF 2 MM AT THE POINT OF FILM RELEASE

ADJUSTMENT OF MAGAZINE SUCKER BAR TILT MOTOR.

The purpose of the TILT MOTOR ASSEMBLY is to tilt the MAGAZINE SUCKER BAR after the VACUUM has been switched on to separate the top FILM from the FILM STACK. The TILT MOTOR drives two CAMS, one CAM operates the two MICROSWITCHES MS3 and MS4 that control the movement of the MOTOR. MS3 operates when the MOTOR is in the "HOME" position, MS4 operates to stop the MOTOR in the "TILT" position. The other CAM drives a PUSHROD and a PALETTE. The PALETTE engages with a RATCHET on the SUCKER BAR to raise the BAR away from the FILM STACK before the tilt occurs to prevent the top FILM being dragged across the next FILM in the STACK and causing abrasion marks. After the lift has occurred, the continuing rotation of the MOTOR operates the PUSHROD to tilt the SUCKER BAR. The CAM MOTOR stops for a time controlled by PARAMETER P5 "TILT PAUSE" to allow any other FILMS picked up to drop back into the MAGAZINE.

The lift that occurs should be between 5 and 8 mm. and can be adjusted by the PALETTE STOP - see the FIGURES opposite. The STOP mist be adjusted by careful bending. However, care must be taken to prevent the RATCHET on the SUCKER BAR from hitting the end of the PALETTE as the SUCKER BAR drops into the MAGAZINE or intermittent LOAD FAILURES will occur as the MAGAZINE SUCKER BAR will sometimes fail to enter the MAGAZINE.

TILT MOTOR SHOWN IN HOME POSITION



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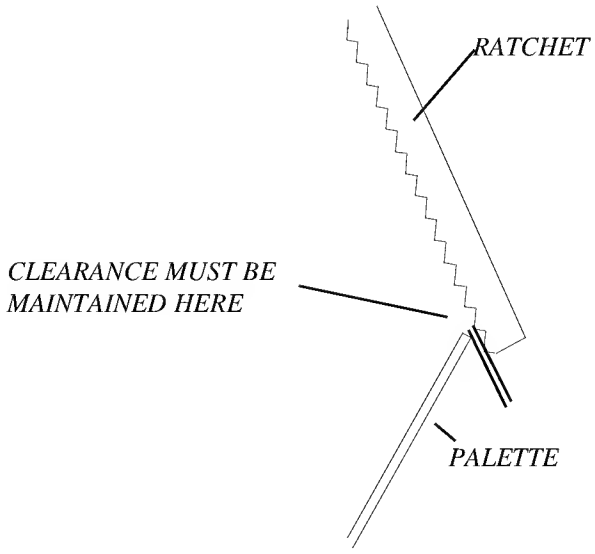
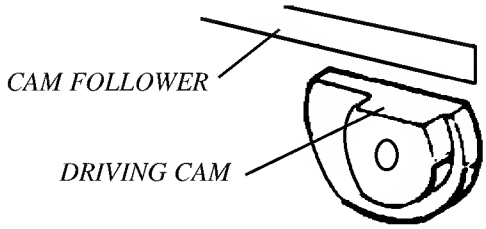
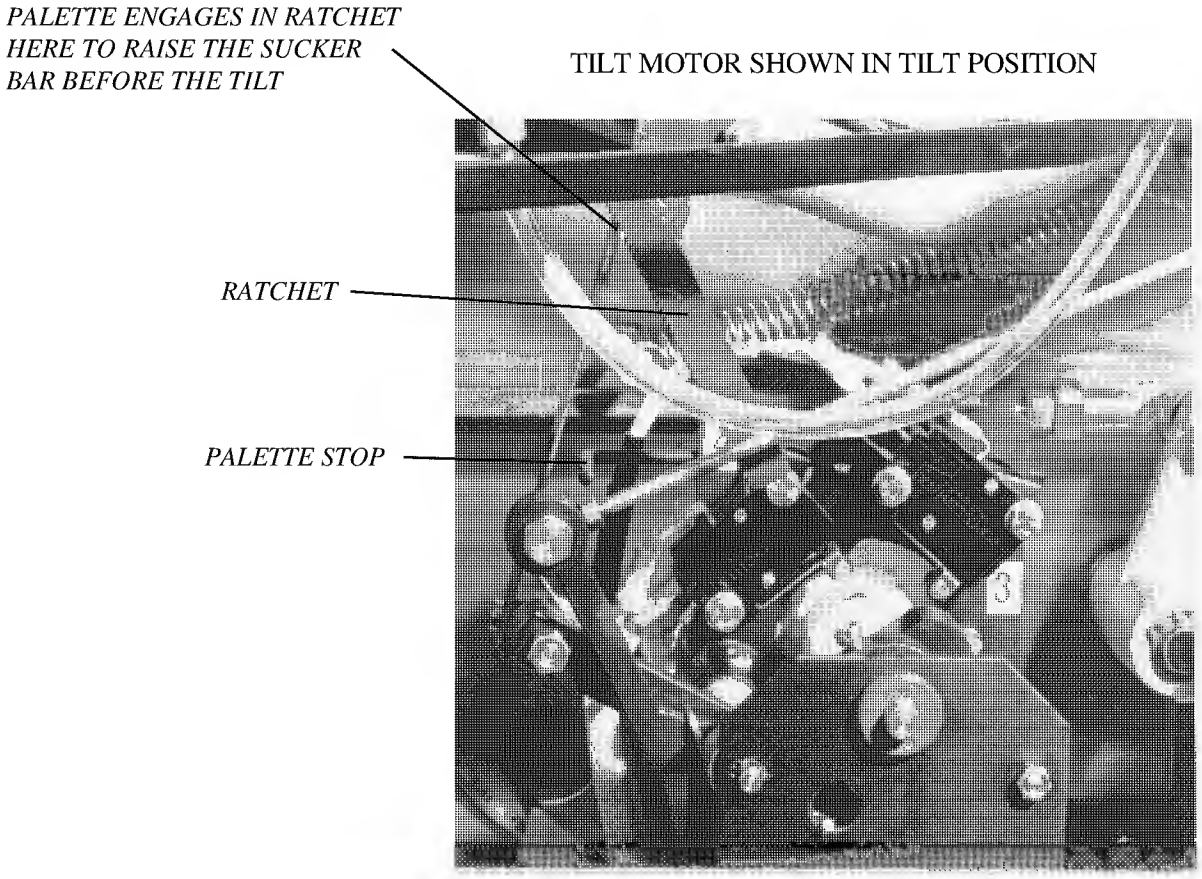


The setting of the MICROSWITCHES is correct when the TILT MOTOR stops in both "HOME" and "TILT" position with the CAM FOLLOWER correctly on the FLAT of the CAM.



TILT MOTOR SHOWN IN TILT POSITION



ADJUSTMENT OF CASSETTE SUCKER BAR.

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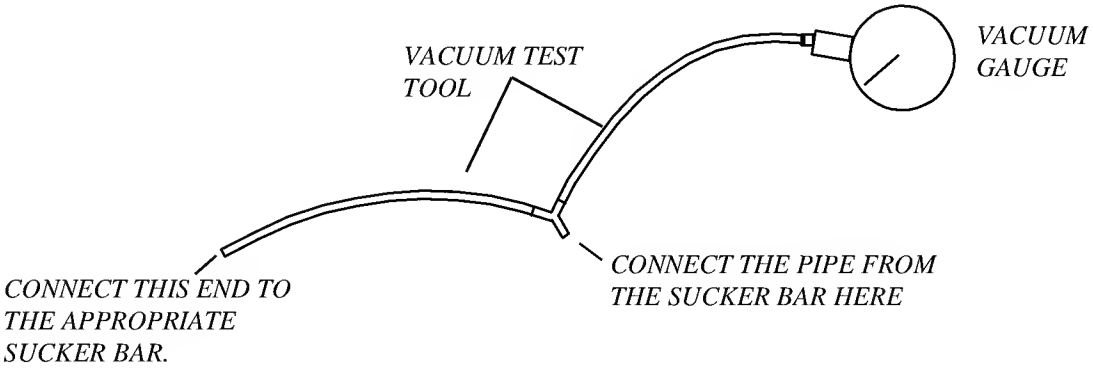
VACUUM SYSTEM

The VACUUM for both SUCKER BARS should be set by means of the BLEED VALVES (see the location drawing at bottom of page) to be between 150 and 200 mBar (4.5 to 6" Hg).

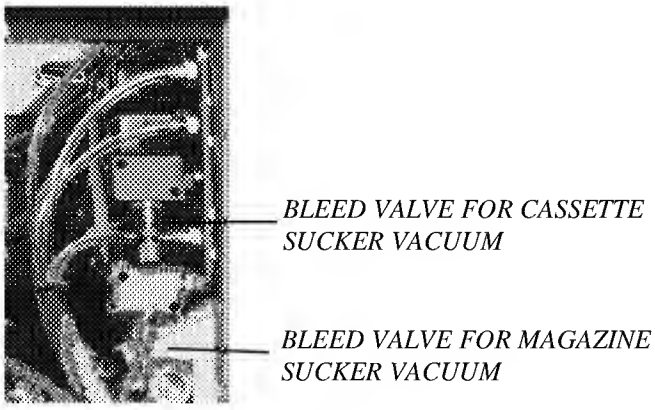
Connect the VACUUM GAUGE into each system in turn using the VACUUM TEST PIPE ASSEMBLY and either fit the STEP-BY-STEP SWITCH and stop the MINILOADER during the cycle to set the VACUUM, or enter TEST MODE and select the appropriate VACUUM PUMP and press a FILM on to the SUCKERS.

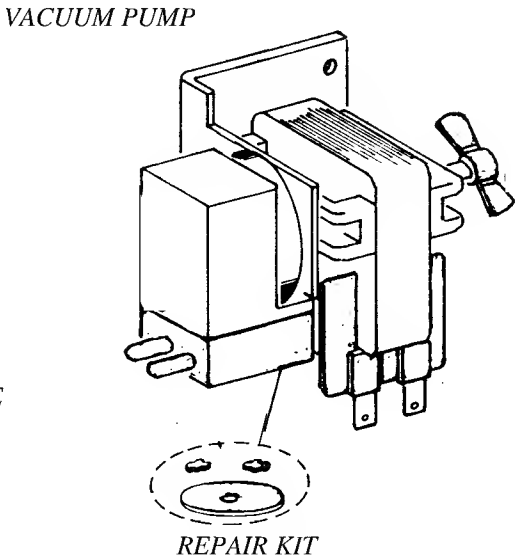
If the VACUUM is set too high, SUCKER MARKS may result. If the VACUUM is too low, the FILMS may not be picked up correctly, or may be dropped.



If the required VACUUM cannot be obtained, isolate part of the SYSTEM to check for leaks. Remember that the SUCKER BAR itself may have a leak. On the MAGAZINE SUCKER BAR, check the "O" RING installed inside the BAR where it connects to the SPIGOT for damage. When refitting the MAGAZINE SUCKER BAR it is advisable to lubricate the "O" RING with a little SILICON GREASE.

If the VACUUM PUMP is faulty, it can be overhauled using the "VACUUM PUMP REPAIR KIT". This KIT contains new FLAP VALVES and DIAPHRAGM.





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PRESSURE SYSTEM.

At the start of a cycle, SOLENOID VALVES SV1 (CASSETTE INJECTOR) and SV2 (MAGAZINE INJECTOR) are opened to allow the COMPRESSOR to start up. After one second, the SOLENOID VALVES close, and the PRESSURE starts to build up. Before the part of the cycle where the CASSETTE INJECTOR is operated, the PRESSURE must reach a minimum value of 2 Bar (typically 2.5 Bar).

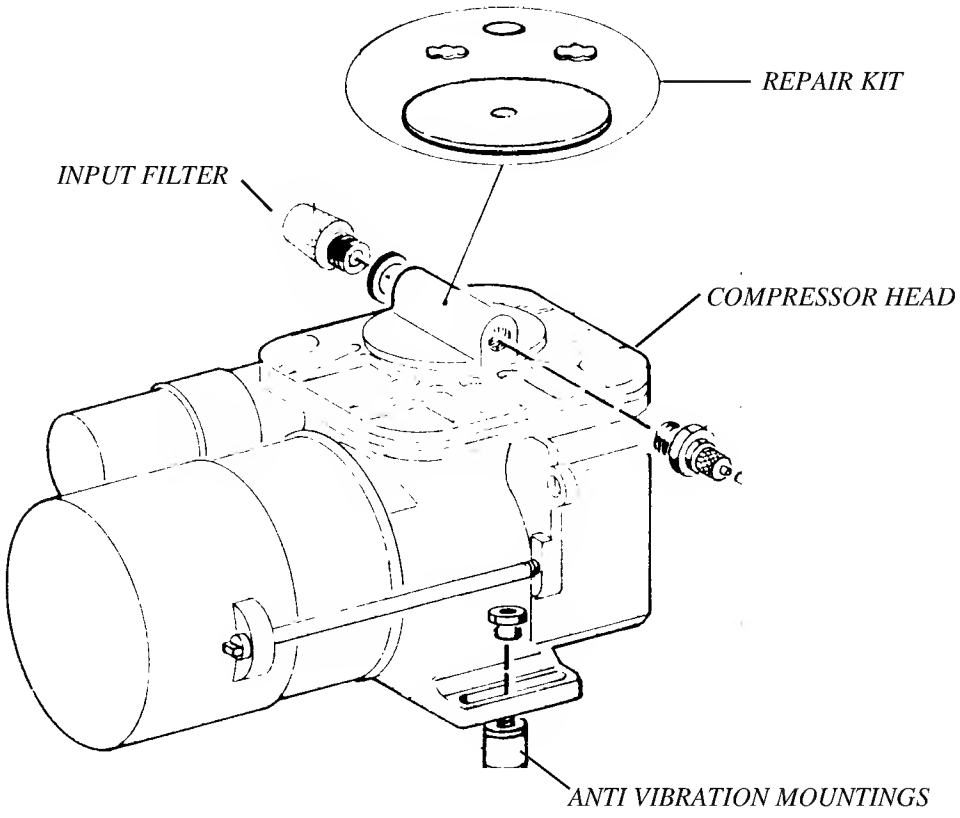
If the PRESSURE is too low, the INJECTORS will not operate correctly, a bad CASSETTE INJECTOR blow causing failure to blow the FILM from the CASSETTE SCREEN and a bad MAGAZINE INJECTOR blow increasing the likelihood of multiple FILM LOADS.

If a minimum PRESSURE of 2 Bar is not reached, first check the PRESSURE SYSTEM for leaks using a solution of soapy water. Fit the STEP-BY-STEP SWITCH and stop the cycle before the CASSETTE INJECTOR operates so maximum pressure is obtained.

If there are no PRESSURE leaks, it will be necessary to overhaul the COMPRESSOR. A "COMPRESSOR REPAIR KIT" is available which contains the essential parts. It is not necessary to remove the COMPRESSOR from the MINILOADER, the HEAD can be separated while the COMPRESSOR is in situ. Remember to check the INPUT FILTER is clean.

Also check that both INJECTORS are clean and are set at the correct height and direction.

If the COMPRESSOR is noisy, check the condition of the ANTI VIBRATION MOUNTINGS.



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HEALTH SCIENCES DIVISION

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